FEA04051-R. 3145. A

NIKONOS V

ニコノス V

REPAIR MANUAL

修 理 指 針

NIPPON KOGAKU K.K.

Tokyo, Japan

SPECIFICATIONS

Contents Page

[1] SPECIFICATIONS M1

SPECIFICATIONS

Type of camera: Electronically controlled 35mm amphibious focal plane shutter camera

Usable film: Standard 35mm cartridge-type film

Standard lens: UW-Nikkor 35mm F2.5 lens

Lens mount: Nikonos bayonet mount

Shutter: SEIKO MFCE226; electronically controlled vertical-travel metal focal-plane type

A(AUTO): Electronically controlled stepless speeds from 1/30 to 1/1000 sec.;

M(MANUAL): Quartz-controlled speeds from 1/30 to 1/1000 sec.;

M90(MECHANICAL): Mechanically controlled at 1/90 sec.;

B(BULB): Mechanical setting for long exposures

Viewfinder: Inverted Galilean type Albada finder built into camera for use with standard 35mm lens;

Film frame marks show approx. 85% picture coverage at infinity (∞);

0.55X magnification

diopter -0.9;

long eyerelief allows viewing with eye 40mm away from finder

parallax correction marks provided

Viewfinder display: LED shutter speed indications 30, 60, 125, 250, 500, 1000;

LED over-and under exposure warning arrows ◀ ▶ ;

thunderbolt-shaped ready-light ϟ

Film-advance lever: Wound in single stroke or series of strokes;

144° winding angle;

hinged for compact storage

Frame counter: Additive type;

When shutter speed/mode selector dial is at "A", shutter releases at approx. 1/1500 sec. until film frame counter reaches frame "1"

Film rewind: Manual via film rewind crank after shutter speed/mode selector dial is set to "R" (Rewind);

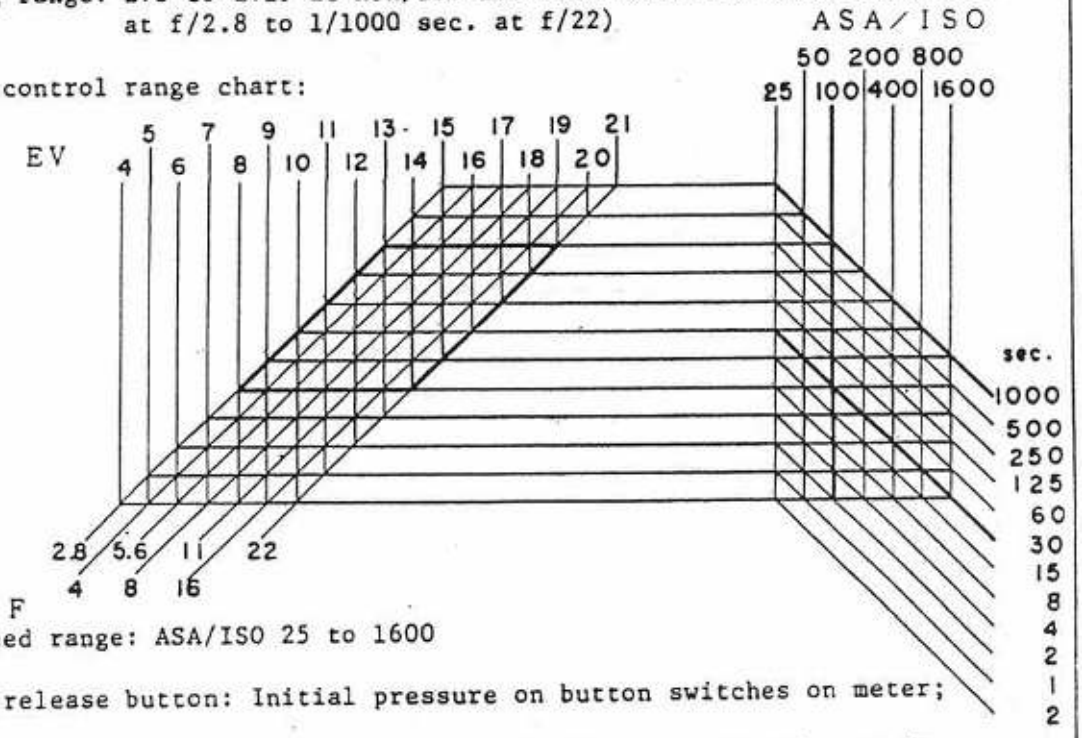
shutter release button is automatically locked

Exposure metering: Through-the-lens(TTL) light intensity feedback metering;

center-weited metering rate 25%

Metering range: EV8 to EV19 at ASA/ISO 100 with F2.8 lens (from 1/30 sec. at f/2.8 to 1/1000 sec. at f/22)

Shutter control range chart:



Film speed range: ASA/ISO 25 to 1600

Shutter release button: Initial pressure on button switches on meter;

meter remains on for 16 sec. after finger is removed

Flash synchronization: X-sync only via five-pins flash socket in camera's base;

Synchronizes at 1/90 sec. or slower;

with Nikonos Speedlight SB-102, shutter speed automatically switches to 1/90 sec. when shutter speed/mode selector dial is at "A" or at 1/125 sec. or higher on manual mode;

at 1/60 sec. or slower on manual, shutter fires at speed set

Flash metering: TTL flash metering with SB-102

Flash ready-light: Thunderbolt-shaped LED in viewfinder lights when SB-102 and others have recycled;

blinks to warn of insufficient light output, improper shutter speed/mode selector dial setting, and film speed setting beyond ASA/ISO 400

Batteries: One 3V lithium battery (CR 1/3 type), two 1.55V silver-oxide batteries (SR-44 type) or one 1.5V alkaline-manganese battery (LR-44 type)

Battery check: Possible when shutter speed/mode selector dial is at any setting except M90, B or R, and frame counter is at or beyond "1";

viewfinder LED lights to indicate proper battery installation and sufficient battery power when shutter release button is depressed

Withstand pressures: Up to $6kg/cm^2$ at a depth of 50m

Dimensions: Approx. 146mm(W) x 99mm(H) x 58mm(D)

Weight: Approx. 695g (without lens)

DISASSEMBLING & ASSEMBLING & ADJUSTMENTS & DRAWINGS

Contents Page

[1] DISASSEMBLING

1. Disassembling procedure outline D1
2. Disassembling chart D2

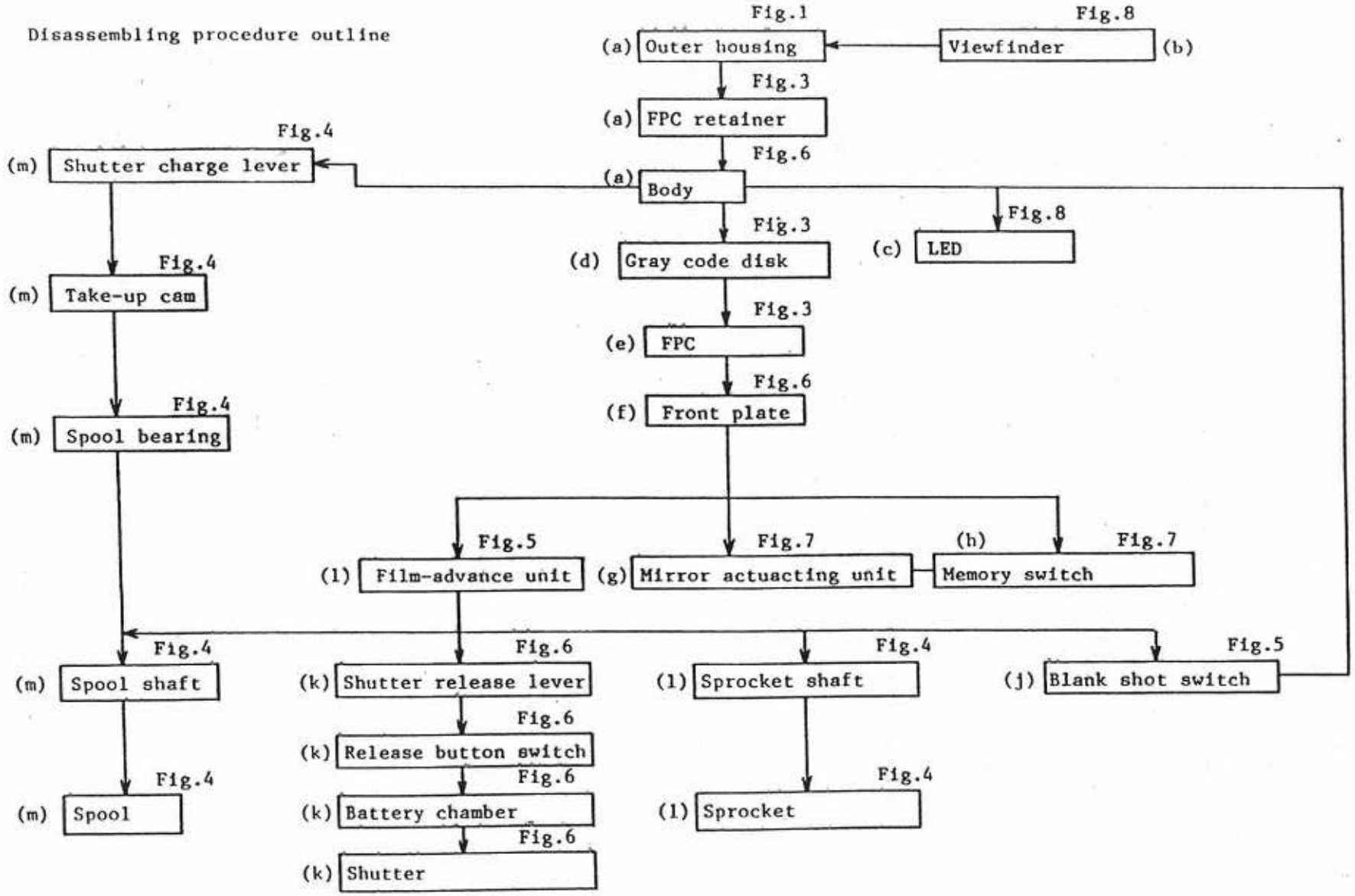
[2] ASSEMBLING & DRAWINGS

1. Pressure Plate & Battery Chamber A1
2. Shutter Mode Selector & Rewind Knob A2
3. FPC A5
4. Take-up Cam, Shutter Charge Lever, Spool & Sprocket A8
5. Film-advance Base Plate A10
6. Shutter, Release Button SW & Battery Chamber .. A14
7. Front Plate A16
8. Viewfinder & LED A18
9. Camera Back A21
10. Camera Back Hinge A23
11. Outer Housing A24

[3] ADJUSTMENTS

1. Parallax adjustments A25
2. Shutter speed adjustments A26
3. Outer housing waterproof test A30
4. Tool battery and tool outer housing A31

Disassembling procedure outline



FEA04051-R.3145.A

Disassembling chart

Note: Remove batteries before disassembling.

(a)-1 Outer housing

Fig.1
Body cover B91 | ⊕ 821 x 4

Fig.3
FPC retainer | ⊕ 844 x 2
LED base plate B71
FPC B2001
FPC retainer #72
FPC spacer #73
FPC retainer #77

Unsolder lead wires.
Lead wire #1097 (black)
- ditto - #1089 (green)
- ditto - #1087 (purple)
- ditto - #1084 (yellow)
- ditto - #1099 (blue)

Fig.2
Film-advance lever B2441
Rubber #443
Screw #438
Film-advance lever B441
Shutter dial B447

Fig.2
Rewind knob
ISO Stopper #675
ISO Rewind knob B667
O-ring #810
Rewind shaft B652
Spring #670
ASA/ISO dial #668

⊕ 827 x 3
Outer housing B112

(a)-2 Camera back lock knob

Fig.10
Lock knob B213 | ⊖ 53
Lock cam #216
Washer #59 x 2
O-ring #803

Fig.10
Lock knob cover #212
Release button #211
⊕ 828 x 2

Fig.10
Spring #217 | ⊕ 822 x 2

(a)-3 Sync terminal

Sync terminal cap B30 | Fig.1

Fig.8
O-ring #811 | ⊕ 841
Sync terminal B3001

(a)-4 Camera back

Cover #220 | Fig.9

Fig.9
Camera back B201 | ⊕ 836 x 2

Camera back hinge #202 | Fig.9

Note: Be careful of battery chamber.

(a)-6 Pressure plate

Fig.1

Pressure plate B81 ⊕ 833 x 2
Bearing 83 x 2
Spring #92
Pressure plate hinge #84

(a)-7 Shutter release button

Leatherette #69 Fig.11

Fig.11

Release button cover B51 ⊕ 839 → Lock knob plate #57 ⊕837 → Lock knob #56

Shutter release button #58 Fig.11

Fig.11

Release button lever B55 ⊕3
Washer #59

Fig.11

Axle B52
O-ring #803

(b) Viewfinder

Fig.8

Front cover #28

O-ring #801
Lens G1 Fig.8

Retainer #17
Lens G2 Fig.8

▽b

▽b

Fig.8

Eyepiece window #16

O-ring #802
Lens G4
Retainer #20 Fig.8

Retainer #18
Lens G3
Spacer #19 Fig.8

(c) LED

Fig.8

LED light-shield #65

Fig.8

LED base plate B71-1 | ⊕ 822 x 2

(d) Gray code disk

Fig.3

Gray code disk B493 | ⊖ 504

Fig.3

Click plate #495

(e) FPC

Fig.3

Unsolder lead wires.

Lead wire, blank shot SW	#485
- ditto -	#486
Lead wire, M.SW	#1081 (black)
- ditto -	#1082 (blue)
Lead wire, battery chamber	#1091 (red)
- ditto -	#1096 (black)
Lead wire, shutter	#1083 (purple)
- ditto -	#1085 (green)
- ditto -	#1086 (brown)
- ditto -	#1088 (blue)
- ditto -	#1090 (white)
- ditto -	#1098 (grey)
- ditto -	#1100 (yellow)
Lead wire, SPD 1	#1092 (orange)
- ditto -	#1093 (purple)
Lead wire, SPD 2	#1094 (brown)
- ditto -	#1095 (green)

⊕ 822 x 1
⊕ 831 x 3
⊕ 839 x 2
⊖ 502 x 3

Note: Use solvent on variable resistors.

e

e

Fig.3

Gray code base plate B491
Spring #498

⊕ 822 x 2
⊕ 842

Note: Separate FPC and Gray code base plate only when replacing FPC.

(f) Front plate

Fig. 6

Front plate B116 | ⊕ 825 x 3
⊕ 835 ⊕ 832 x 2

Fig.7

SPD 1 B99 | ⊕ 832 x 2

Fig.7

Spring #310 | ⊖ 311

Fig.7

SPD 2 B98 | ⊕ 832

(g) Mirror actuating unit

Fig.7

Mirror actuating unit B301 | ⊕ 824 x 2
⊖ 316

Fig.7

Shutter start lever #315

(h) Memory switch

Memory switch B323 | ⊕ 823

Fig.7

(i) Film-advance unit

Fig.5
Film-advance unit B2451 | ⊖ 500x2

Fig.5
Frame counter gear #477

(j) Blank shot switch

Fig.5
Blank shot switch B492 | ⊕ 823

(k) Shutter

Fig.6
Shutter release lever B426
Release lever spring #428
⊖ 433 x 2

Fig.6
Release button switch #429 | ⊕ 823

Fig.6
Battery chamber B43 | ⊕ 826 x 2

Fig.6
Shutter B100
⊕ 822 x 2
⊕ 821

(l) Sprocket

Fig.4

Sprocket gear	#466	⊕ 413
Sprocket shaft	#424	
Sprocket collar	#416	
Sprocket spring	#419	
Washer	#862	
Sprocket	#507	

(m) Spool

Fig.4
Acceptor #437 | ⊕ 829

Fig.4
Shutter charge lever B406
⊕ 408
⊕ 412

Fig.4

Washer	#421
Adjuster	#418
Take-up cam	#401
⊕ 423	

Fig.4
Spool bearing #405
Note: Left-hand thread
Tool: J11152

Light-tight washer #23 Fig.4
Note: Apply adhesive material

Fig.4
Spool shaft B2425

Fig.4
Spool #506

Fig.4
Spool internal tube #422

V. O ring ref. NO. 10713 φ6"

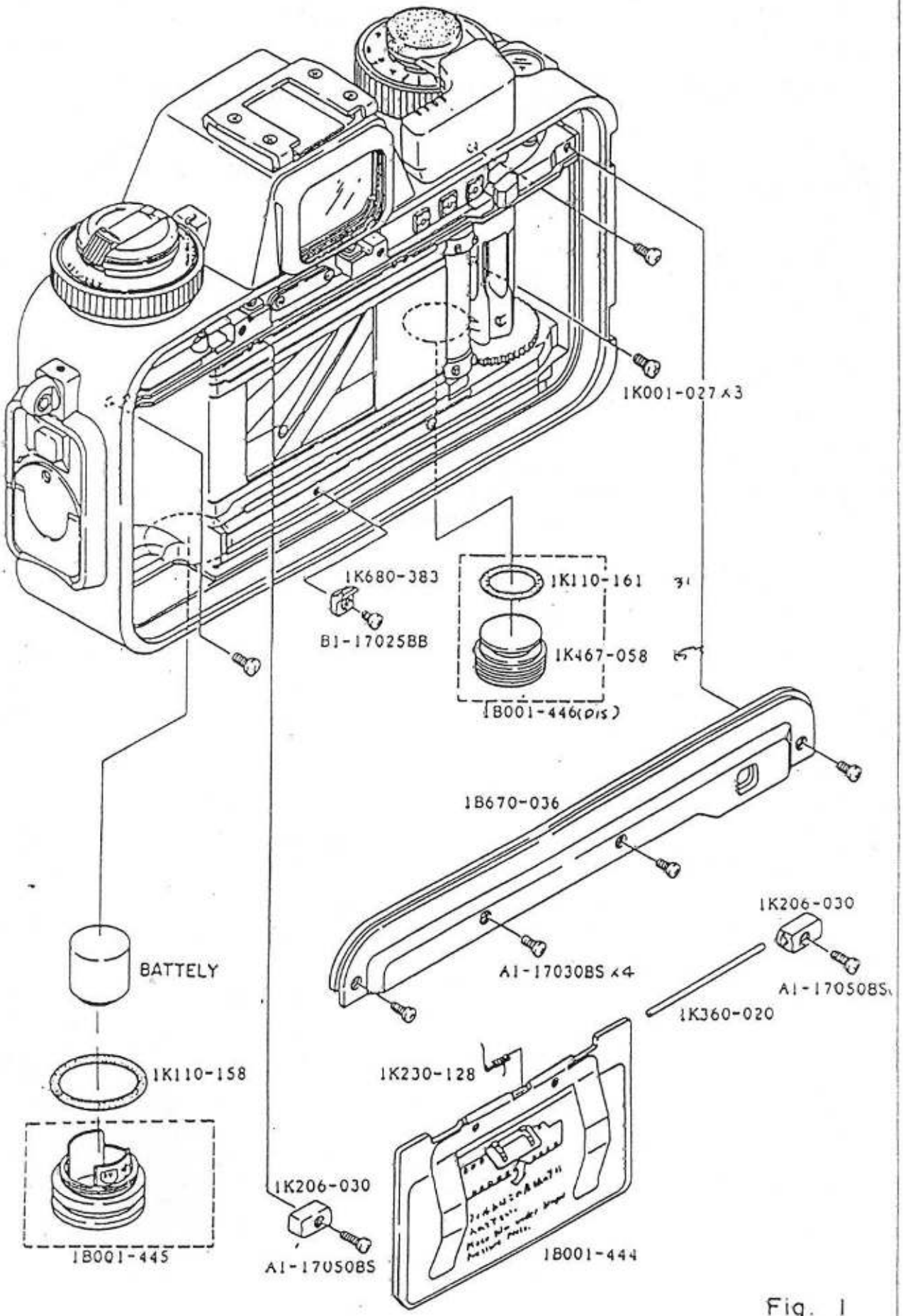


Fig. 1

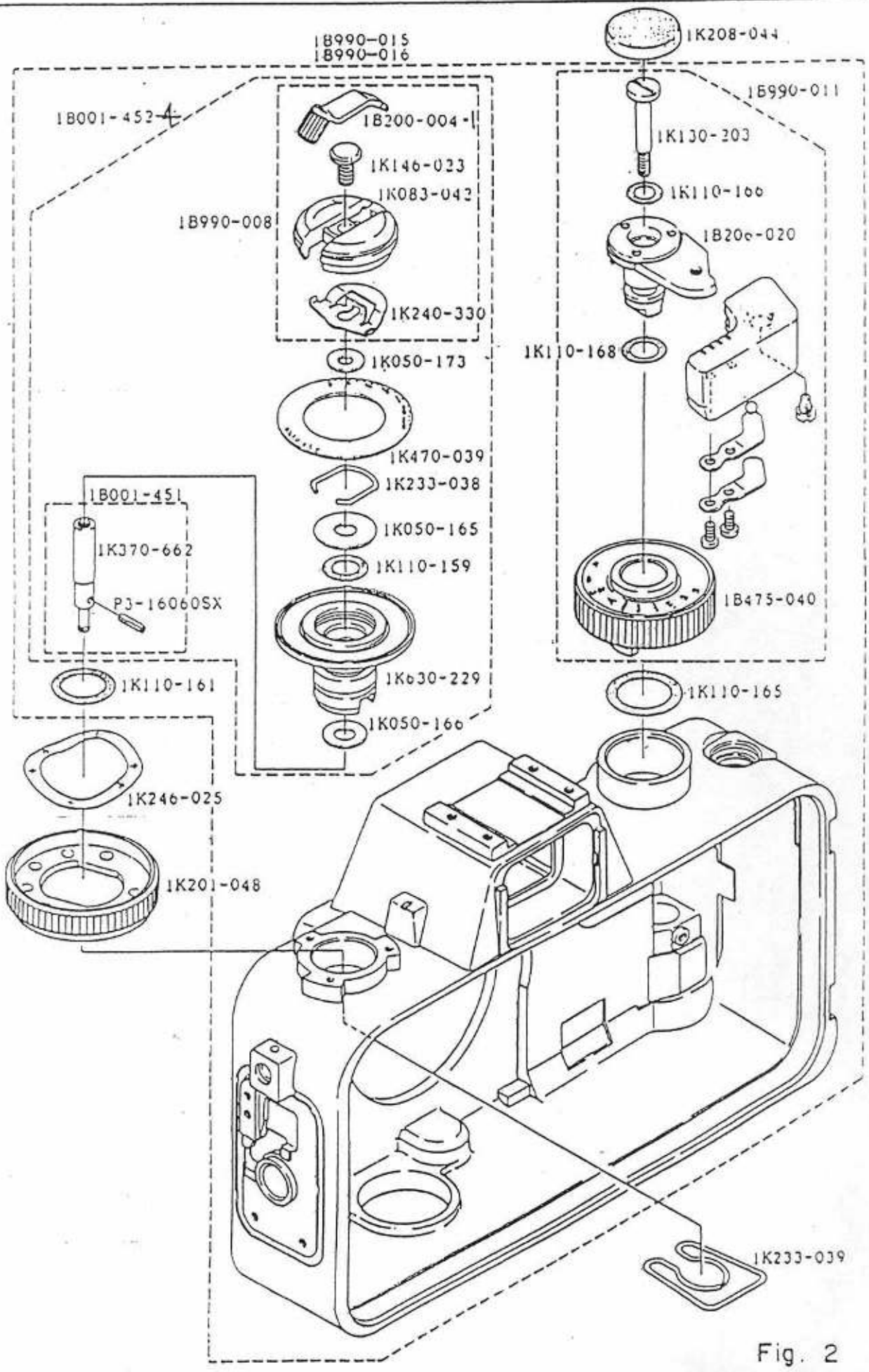
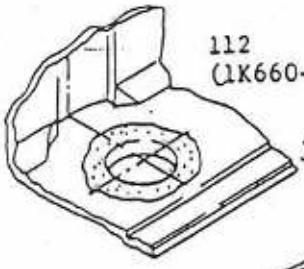

1B990-015
1B990-016
1K208-044
1B990-011
1B001-452
1B200-004
1K130-203
1K146-023
1K110-166
1K083-042
1B990-008
1B200-020
1K240-330
1K110-168
1K050-173
1K470-039
1K233-038
1B001-451
1K050-165
1K370-662
1K110-159
PJ-16060SX
1B475-040
1K630-229
1K110-161
1K110-165
1K050-166
1K246-025
1K201-048
1K233-039

Fig. 2

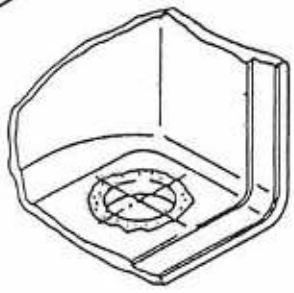
Fig.2-1 Oil barrier application



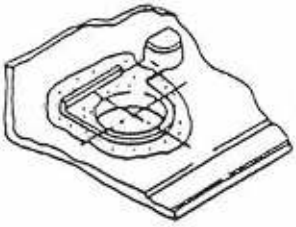
112
(1K660-038)

Oil barrier:
Sumiflunon FP81

1) Shutter dial opening

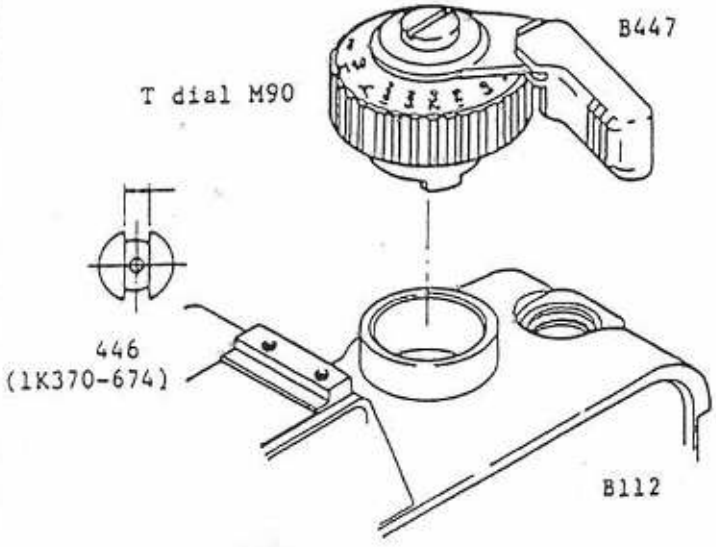


2) Rewind shaft opening



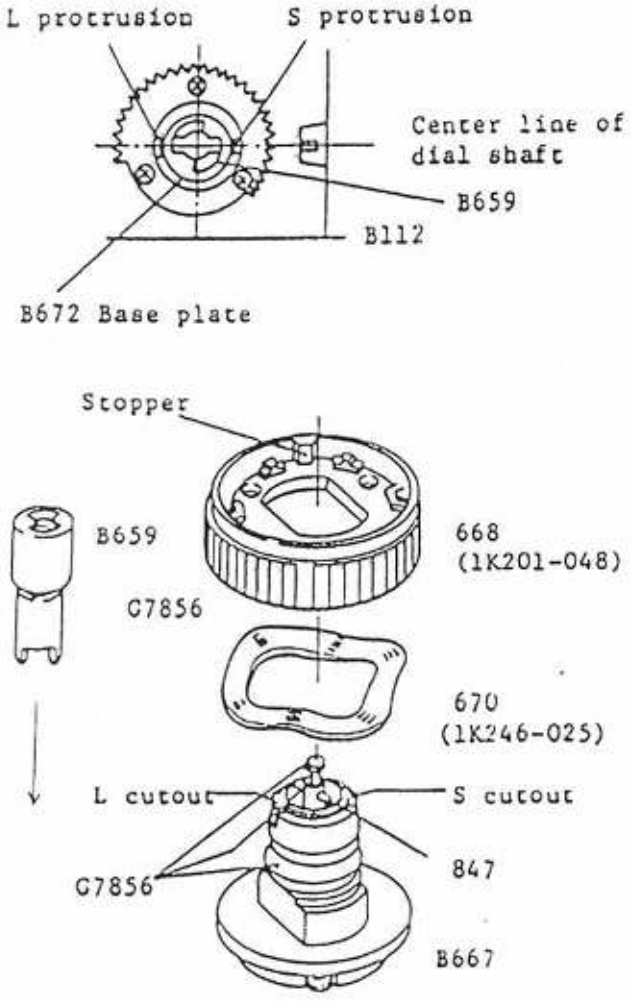
3) Battery chamber opening

Fig.2-2 Shutter dial/film-advance lever installation



Set shutter dial to M90 when installing

Fig.2-3 ASA/ISO dial installation



1) Align L protrusion and S protrusion of B672 with the center line of dial shaft.

2) Align forks of B659 with the center line of dial shaft.

3) Position stopper of ø668 near L cutout of B667.

4) Align Spring cotter ø847 with L cutout and S cutout of B667.

5) Fit L protrusion of B672 with L cutout of B667.

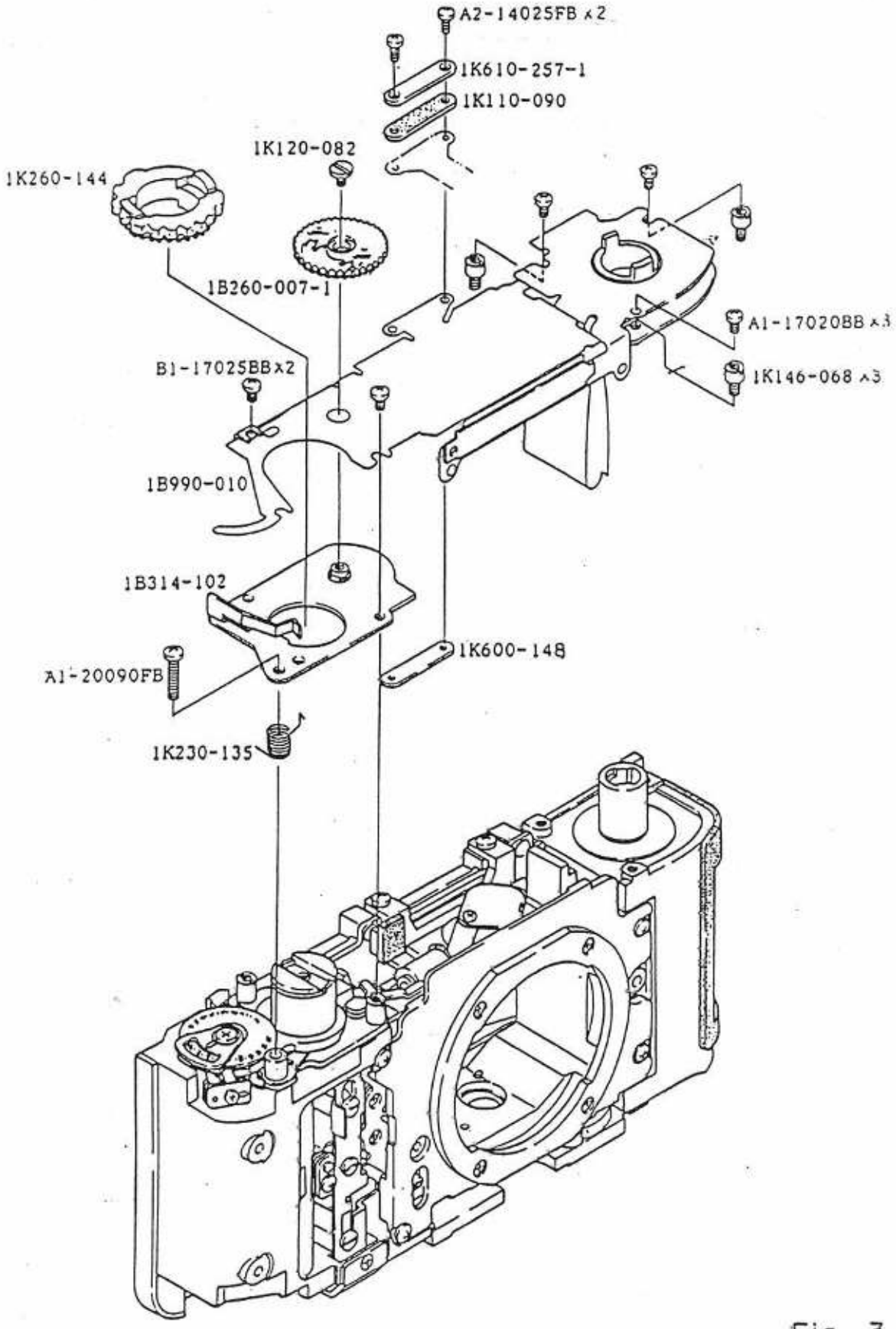
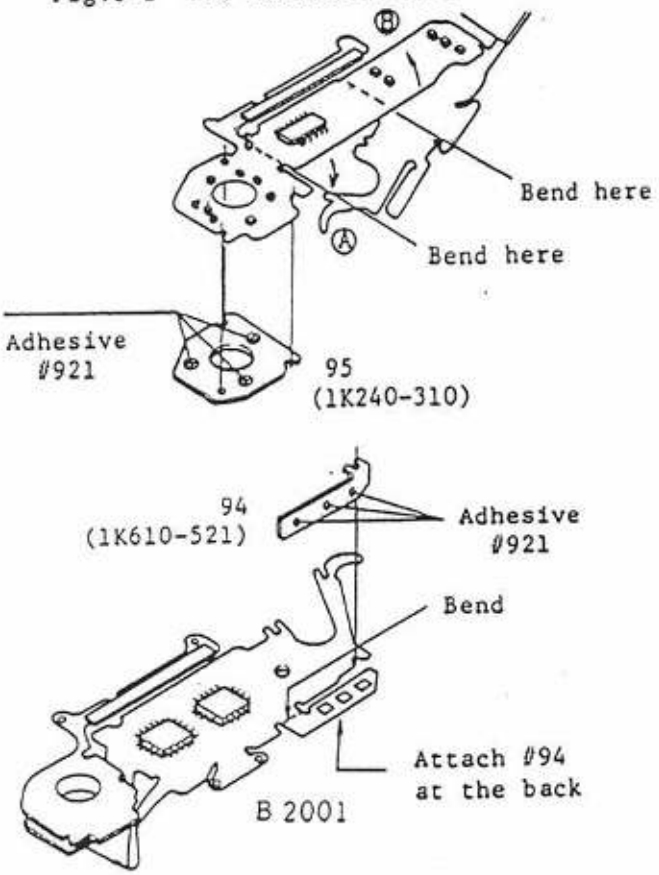

A2-14025FB x2
1K610-257-1
1K110-090
1K120-082
1K260-144
1B260-007-1
A1-17020BB x3
1K146-068 x3
B1-17025BB x2
1B990-010
1B314-102
1K600-148
A1-20090FB
1K230-135

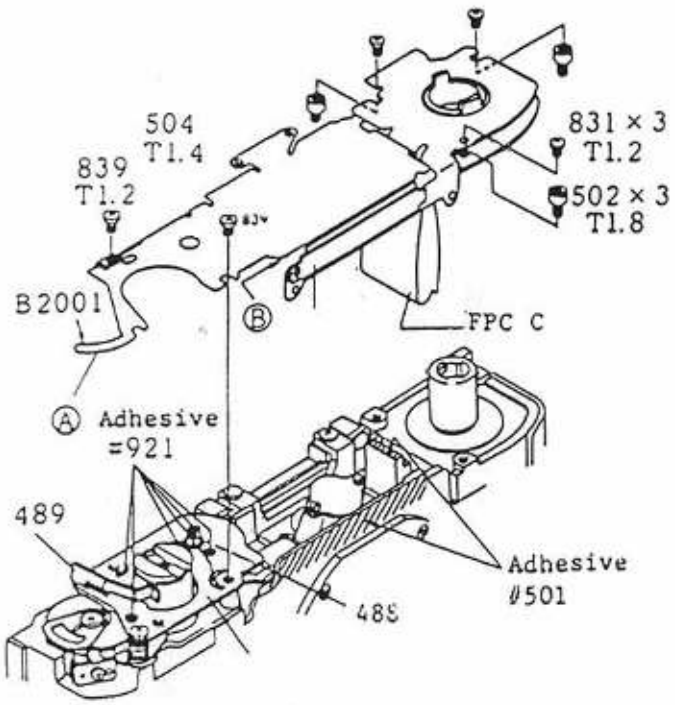
Fig. 3

Fig.3-1 FPC installation 1



Bend FPC 90° in the direction Ⓐ and 180° in the direction Ⓑ.

Fig.3-2 FPC installation 2



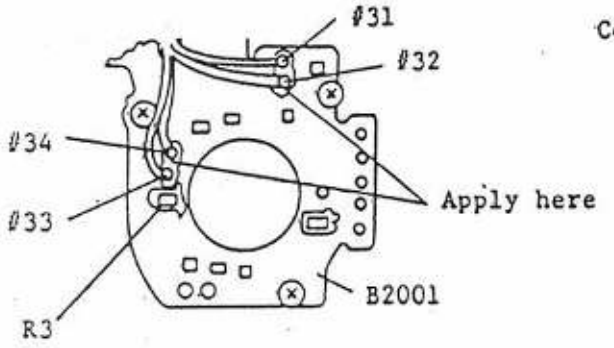
1) Apply #921 for six points on the top of B491 and for two points on the edge of front plate.

2) Insert FPC Ⓐ into the space under #489 and fit it along #488. Screw #839 to fix FPC Ⓐ.

3) Insert FPC Ⓒ into the space between body and front plate.

Note: Be careful not to extend FPC Ⓑ from the edge of front plate

Fig.3-3 Moisture-proof coating application



Coating material: Fumiseal 1B66

Fig.3-4 FPC retainer

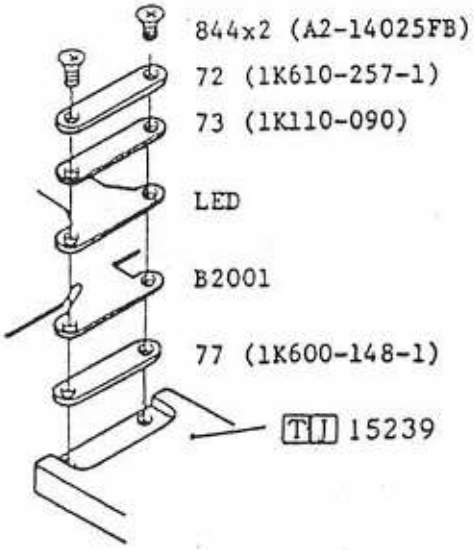
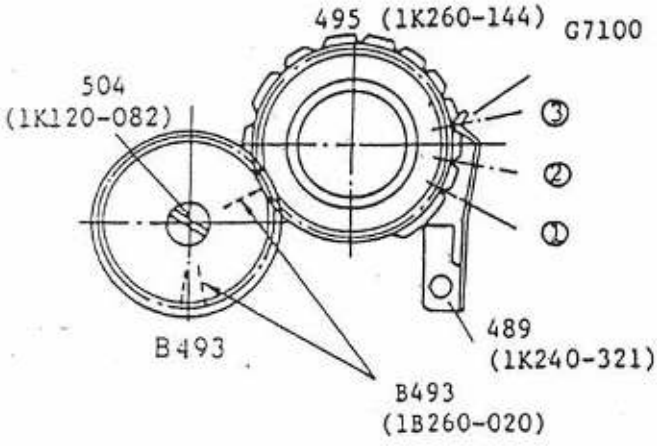


Fig.3-5 Gray code disk



1) Set Ø489 aside from Ø445 and fit protrusion under Ø495 in cutout of cam on B2451. Engage Ø489 with the third step of Ø495.

2) Clean gray code patterns and brushes.

3) Fit B493 onto Ø488 and engage Ø493 with Ø495.

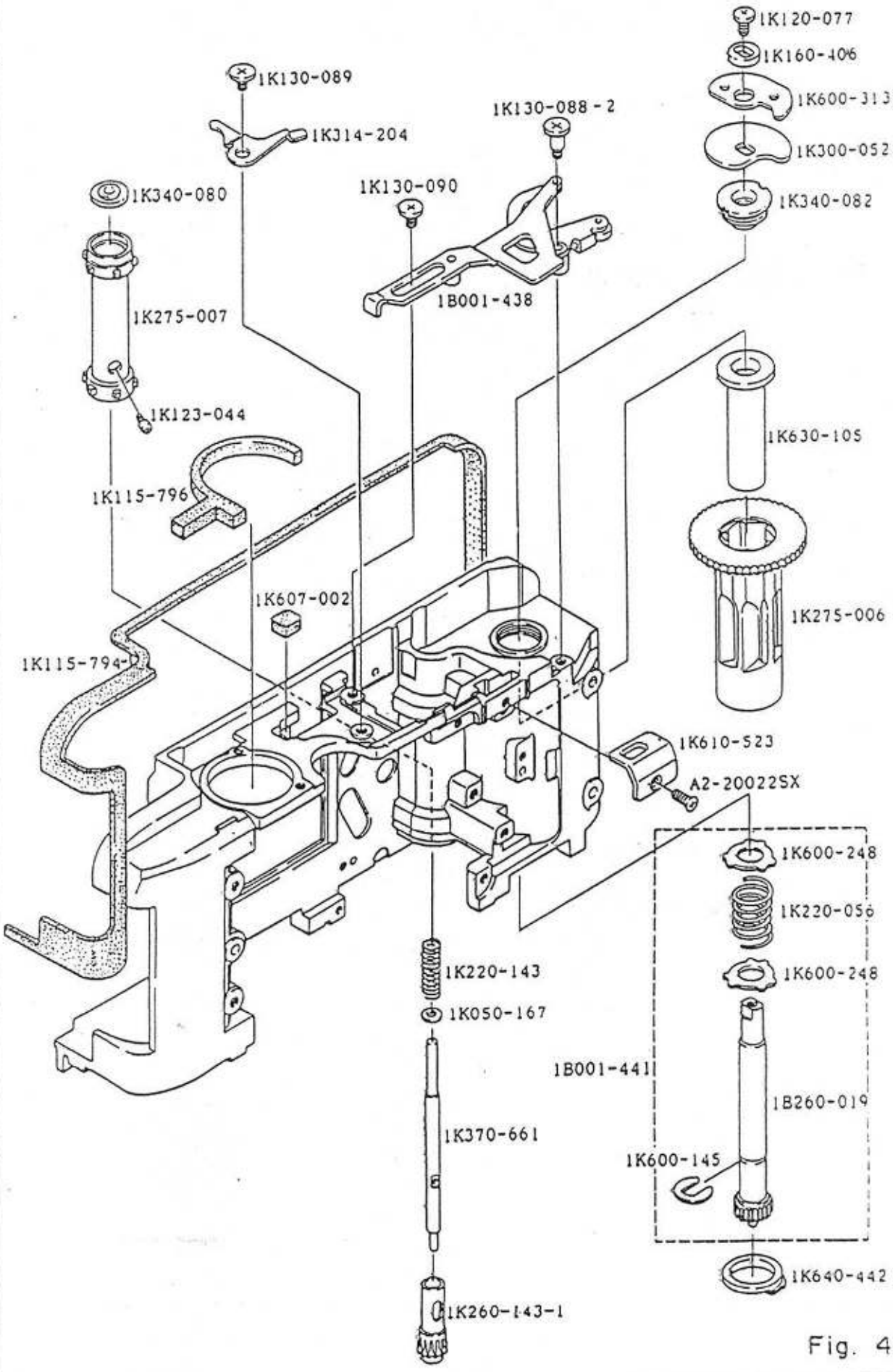

1K120-077
1K160-406
1K600-313
1K300-052
1K340-082
1K130-089
1K314-204
1K130-088-2
1K130-090
1B001-438
1K340-080
1K275-007
1K123-044
1K115-796
1K630-105
1K275-006
1K607-002
1K115-794-D
1K610-523
A2-20022SX
1K600-248
1K220-056
1K600-248
1K220-143
1K050-167
1B001-441
1B260-019
1K370-661
1K600-145
1K640-442
1K260-143-1

Fig. 4

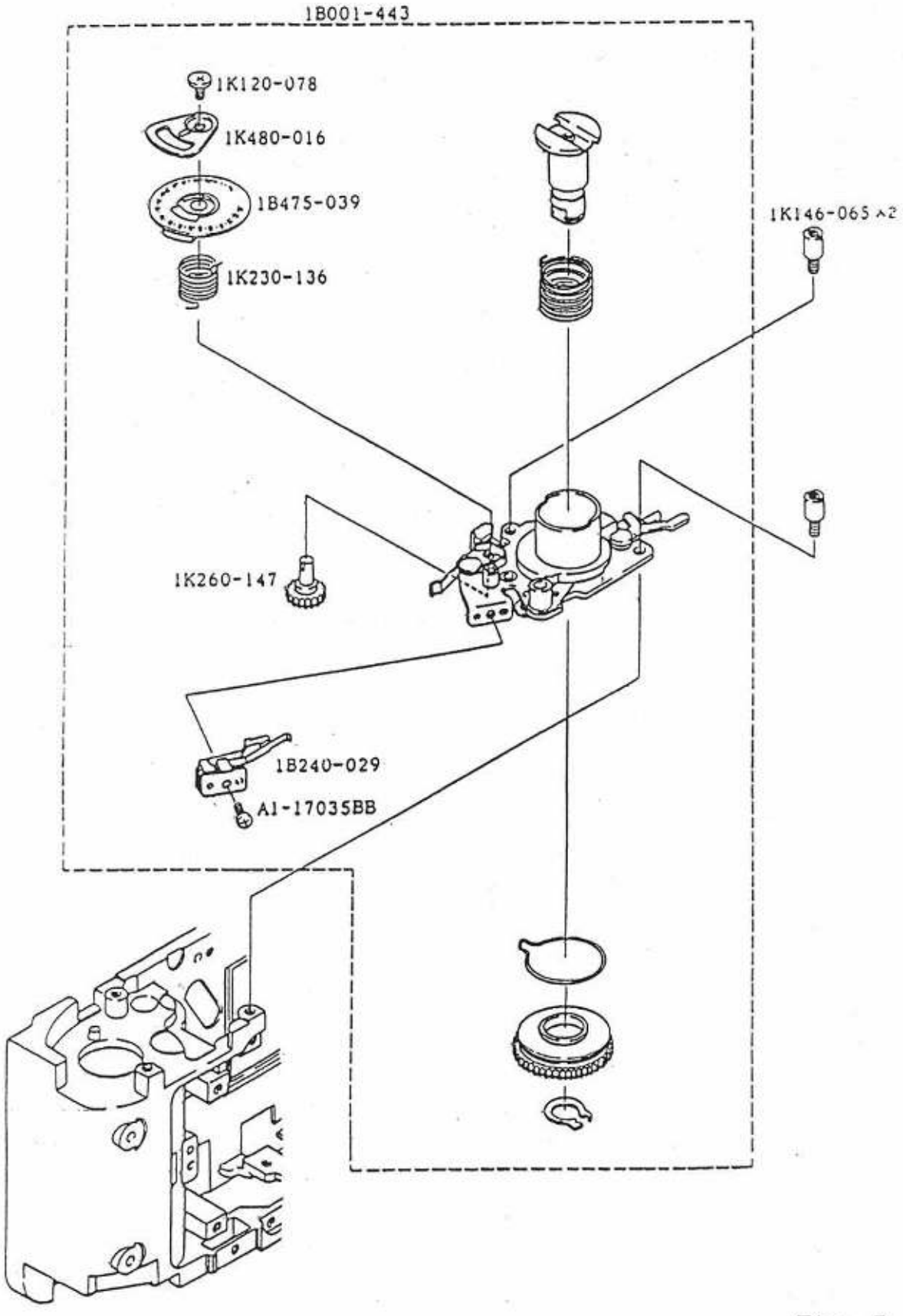
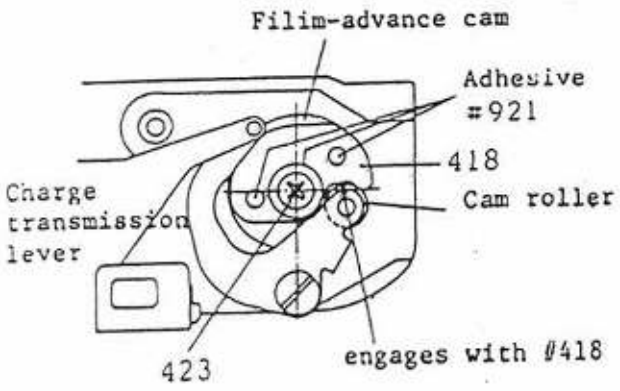

1B001-443
1K120-078
1K480-016
1B475-039
1K230-136
1K146-065 ×2
1K260-147
1B240-029
A1-17035BB

Fig. 5

Fig 4-1 Film-advance timing adjustment



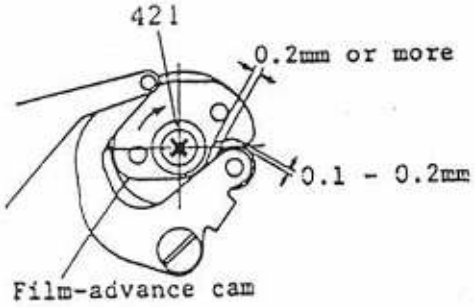
1) Use fingers to hold sprocket and spool slightly. Then stroke film-advance lever slowly.

   Cam roller should engage with #418 when film-advance is completed.

2) After film-advance completion, clearance between shutter release lever and shutter charge lever should be 0.5 - 1mm.

3) Charge transmission lever should not come in contact with #421.

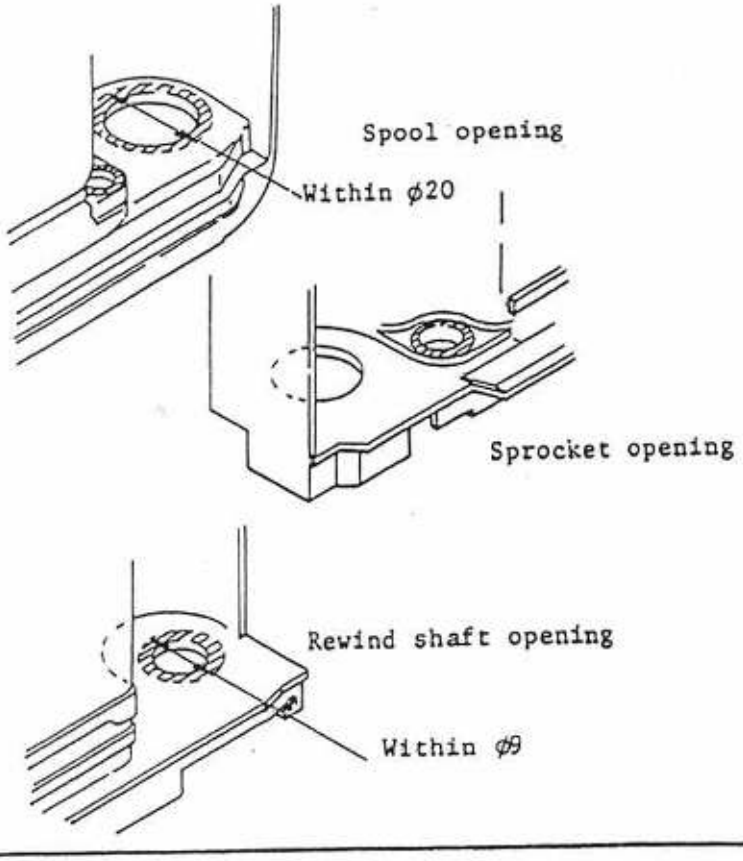
4) Clearance between cam roller and film-advance cam should be 0.2mm or more.



Tighten Film-advance set screw #423 temporarily.
After adjustment, apply Adhesive #921 onto the sections of #418 indicated in Figure 4-1.
Then tighten #423 securely.

Fig 4-2 Oil barrier application

Oil barrier:
Sumiflunon FP81



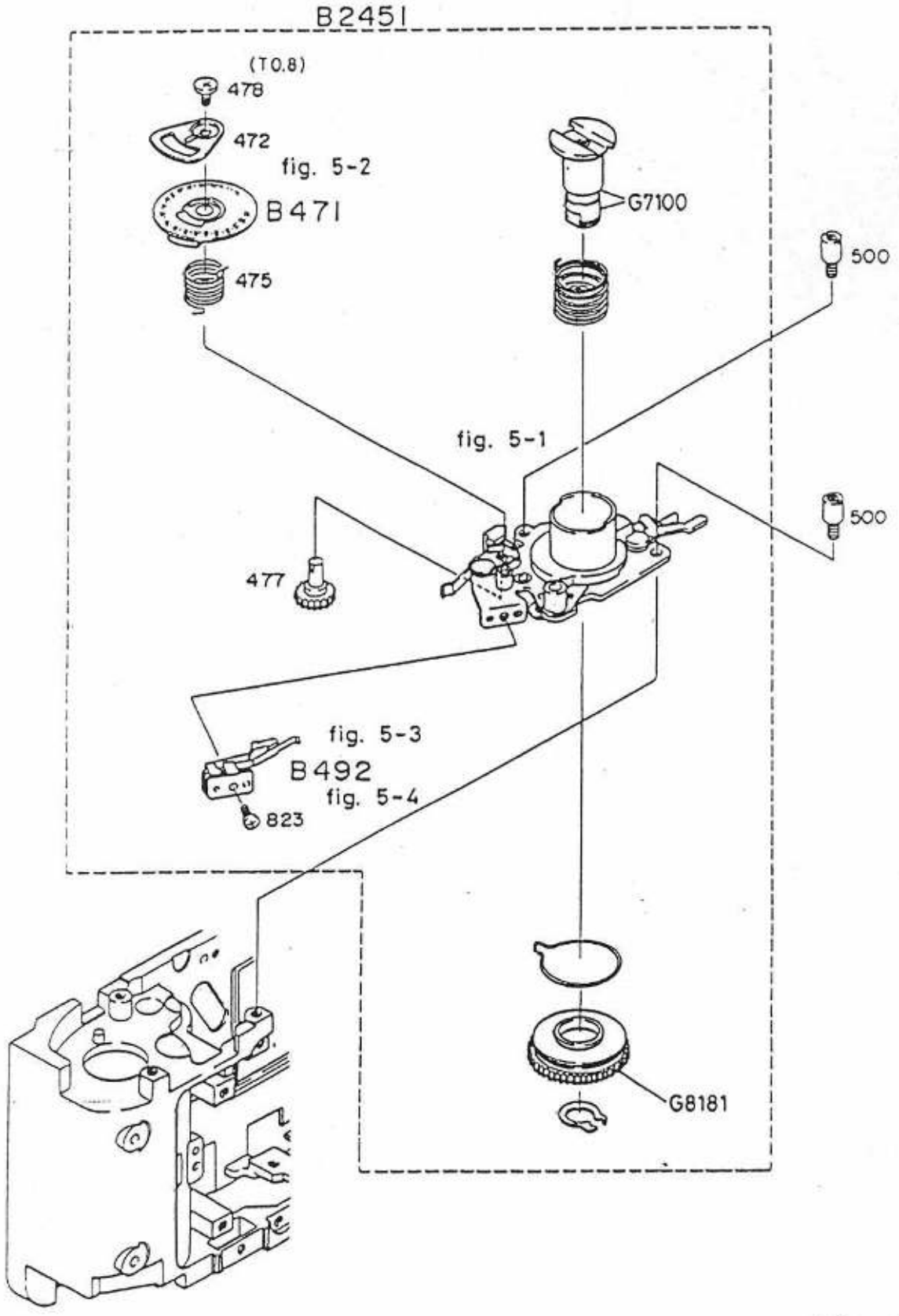
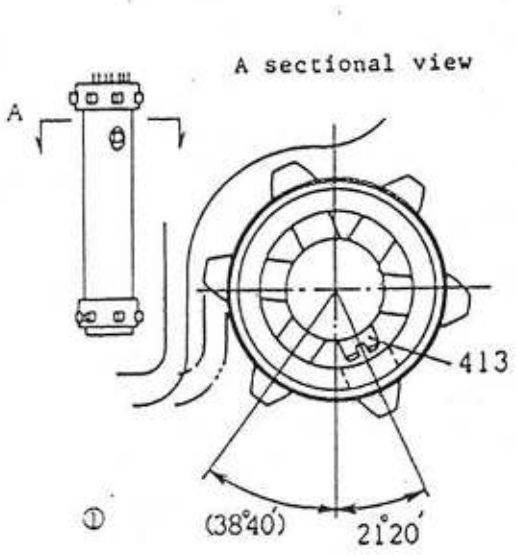
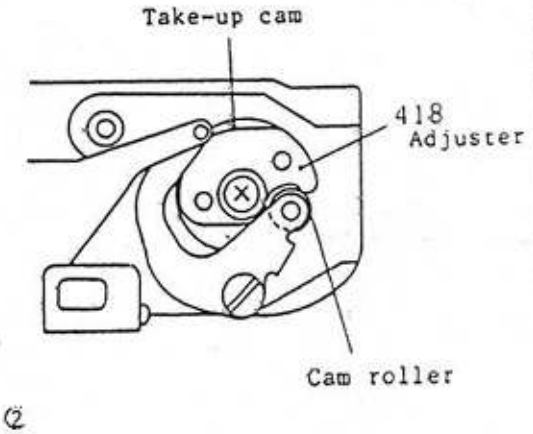

B2451
(T0.8)
478
472
fig. 5-2
B471
475
G7100
500
fig. 5-1
500
477
fig. 5-3
B492
fig. 5-4
823
G8181

Fig. 5

Fig.5-1 Film-advance unit





1) Tighten #438 temporarily to fix film-advance lever.

2) Position sprocket and take-up cam as shown above.

3) Position kerf of #477 in the counter direction of frame counter.

4) Turn film-advance lever one and half turn counterclockwise to put spocket stopper lever into sprocket stopper hole.

5) Place coupling lever against change-over shaft.

6) Fit spool and sprocket shafts with openings of film-advance unit and engage gears.

Check if frame counter advances during one stroke of film-advance lever.

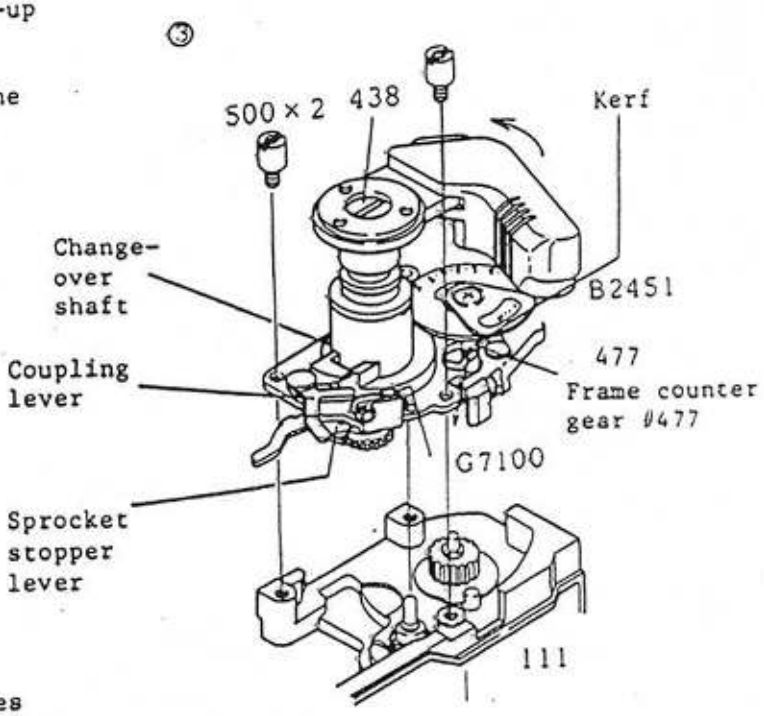


Fig.5-2 Frame counter index position

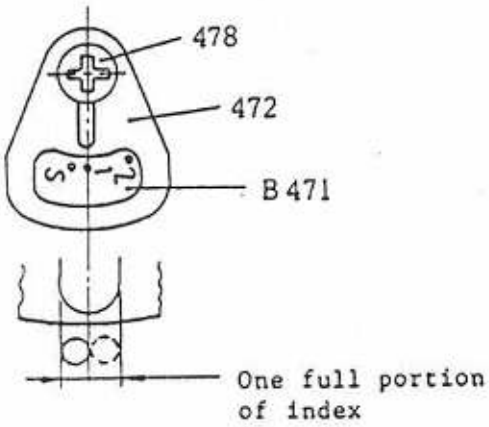
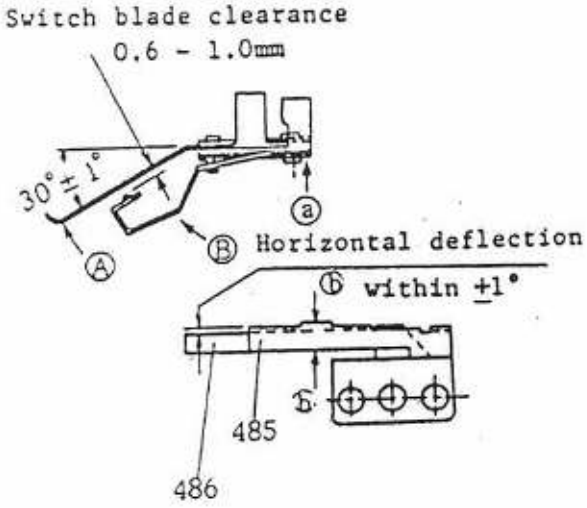
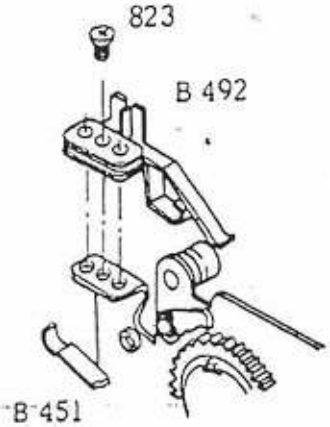


Fig.5-3 Frame counter switch 1



1) Insurance resistance between #486 and #485: 100MΩ or more

2) Resistance between #486 and #485: 0.2MΩ or less



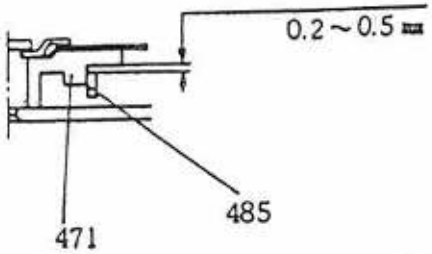
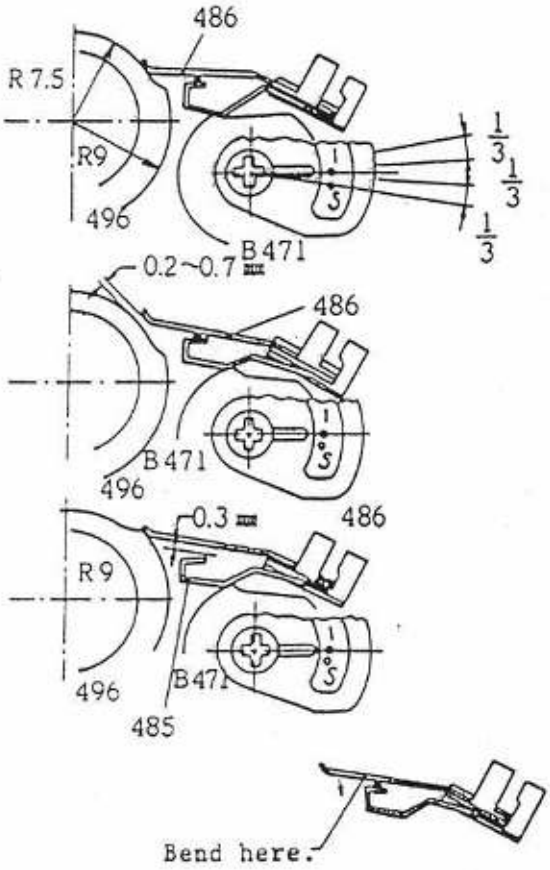


Fig.5-4 Frame counter switch 2



1) Set shutter dial to A. Frame counter switch should turn on when frame counter reaches the 1/3 - 2/3 point between the second dot and "1".

2) Clearance between #486 and #496 should be 0.2 - 0.7mm when frame counter advances from "1" to "36".

3) Set shutter dial to B or M90. Clearance between #485 and #486 should be 0.3mm or more when frame counter advances from "1" to "36".

Shutter, Release Button SW & Battery Chamer

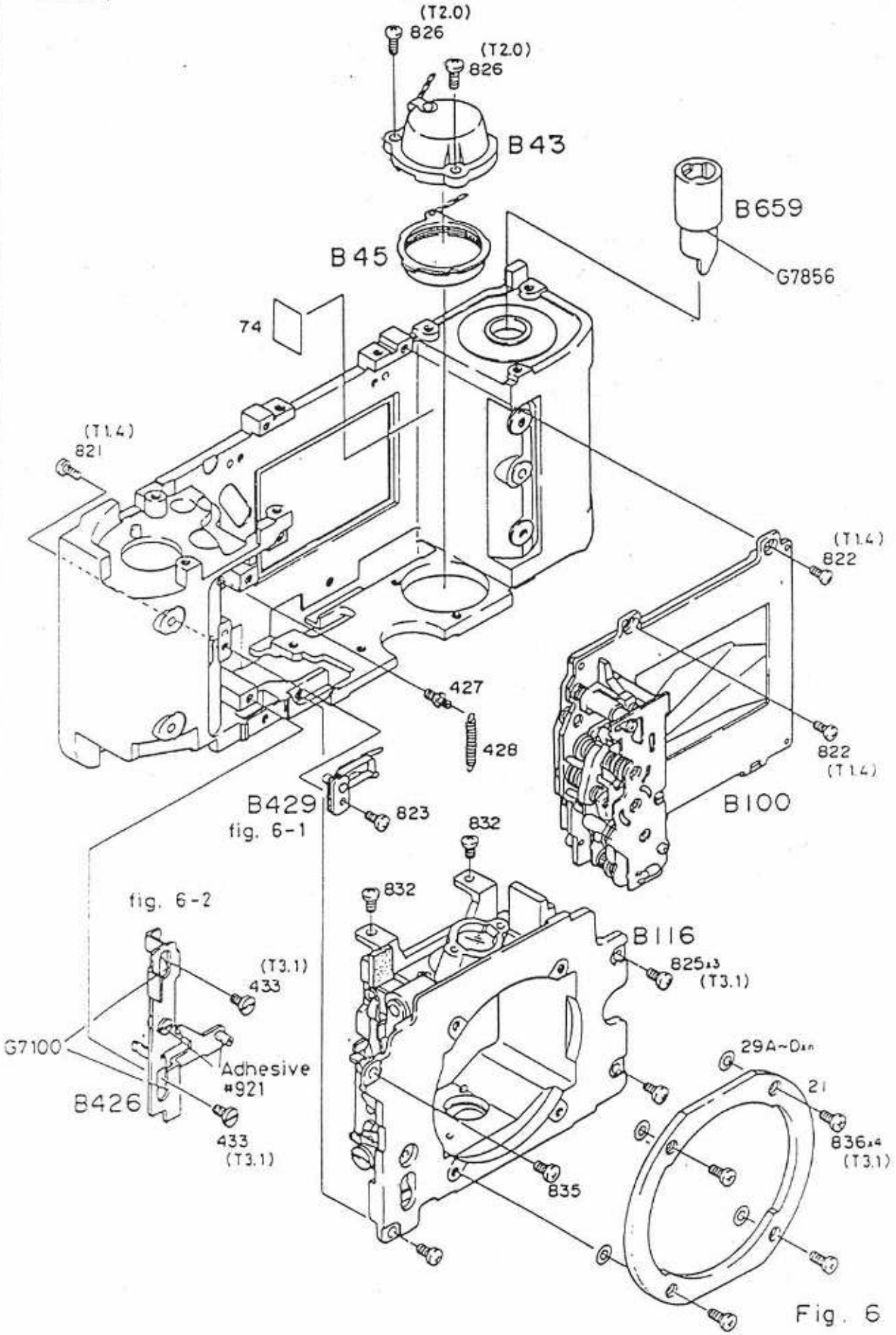
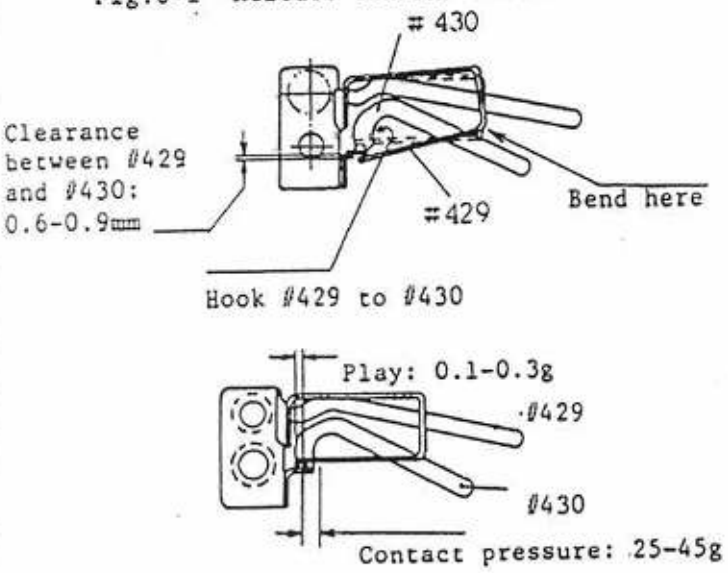


Fig. 6

Fig.6-1 Release button switch



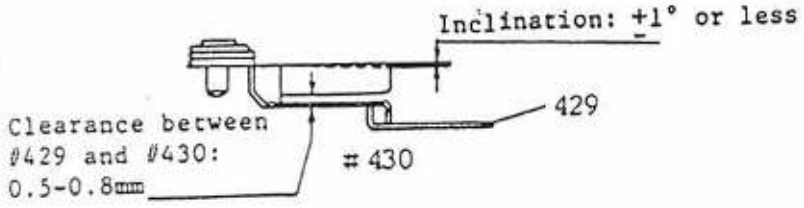


Fig.6-2 Release button stroke

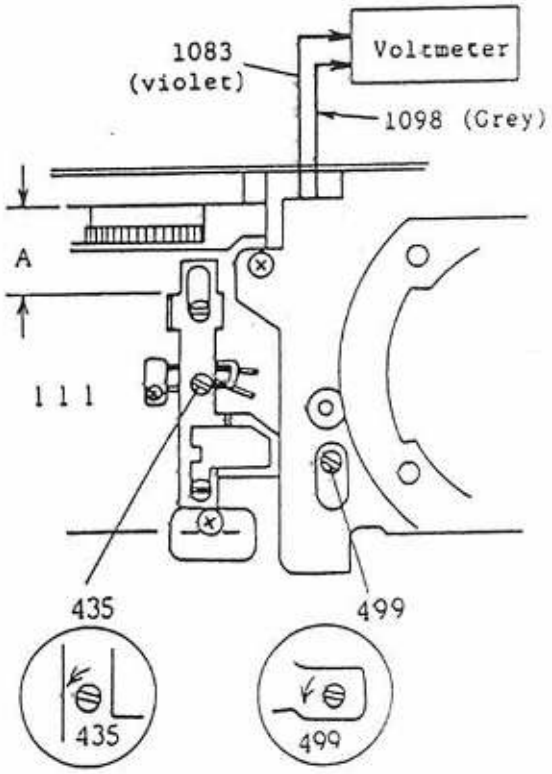
1) Connect a voltmeter to Lead wires #1083 (violet) and #1098 (grey)

2) Set shutter charged condition.

3) Use a slide caliper to measure the distance (A) from top of body to step of B426.

4) Slide the caliper down to turn release switch on and move the voltmeter's needle. Measure this stroke (B).
(A) - (B): 1.0 - 1.2mm
To adjust, turn #435.

5) Slide the caliper down to release shutter.
Measure this stroke (C).
(A) - (C): 3.1 - 3.2mm
To adjust, turn #499.



Note: (B) - (C): 2mm or more

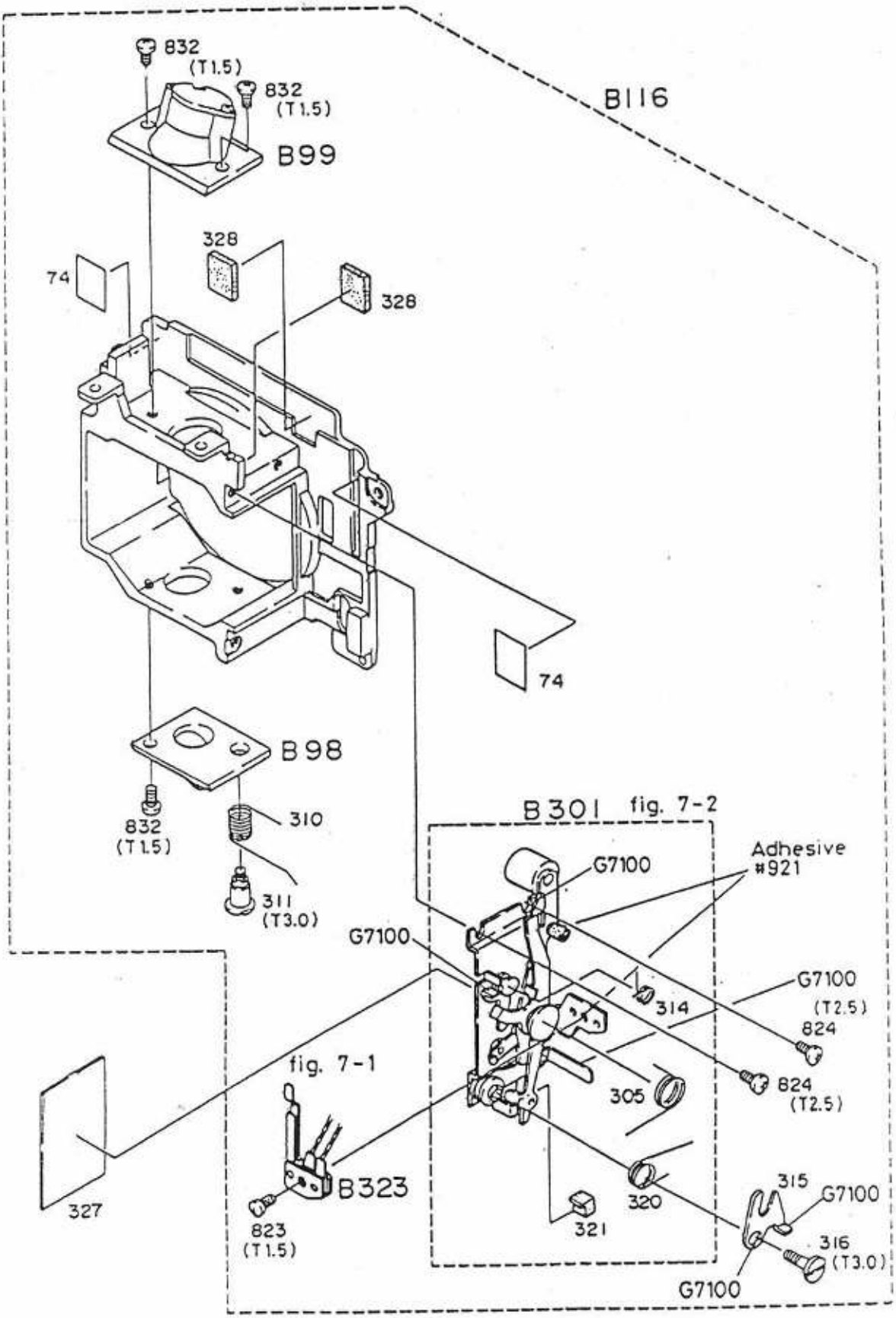
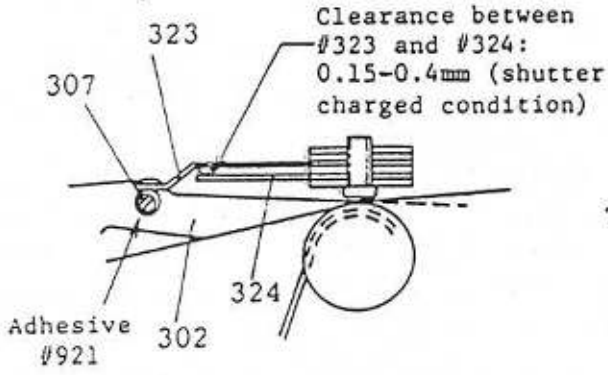
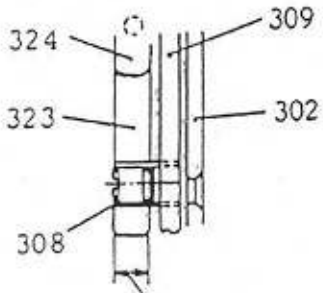

832
(T1.5)
832
(T1.5)
B99
B116
328
74
328
74
B98
832
(T1.5)
310
311
(T3.0)
B301 fig. 7-2
Adhesive
#921
G7100
G7100
G7100
(T2.5)
314
824
824
(T2.5)
fig. 7-1
305
B323
327
823
(T1.5)
320
321
315
G7100
316
(T3.0)
G7100

Fig. 7

Fig.7-1 Memory switch

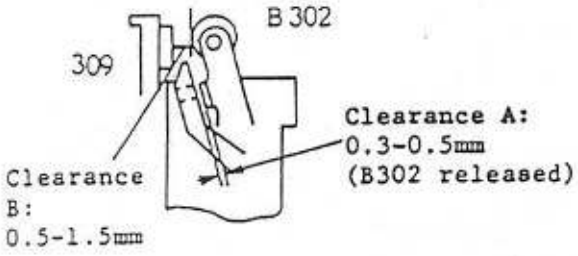


To adjust the clearance, turn #307.

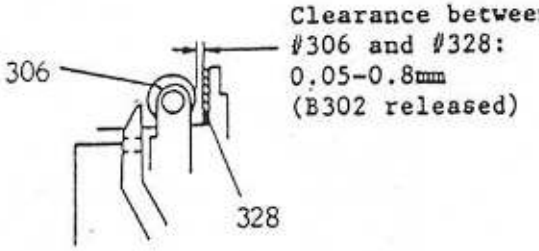


Engagement of #308 with #323: 1mm or more

Fig.7-2 Mirror actuating lever



To adjust the clearance, change the installed position of B301.



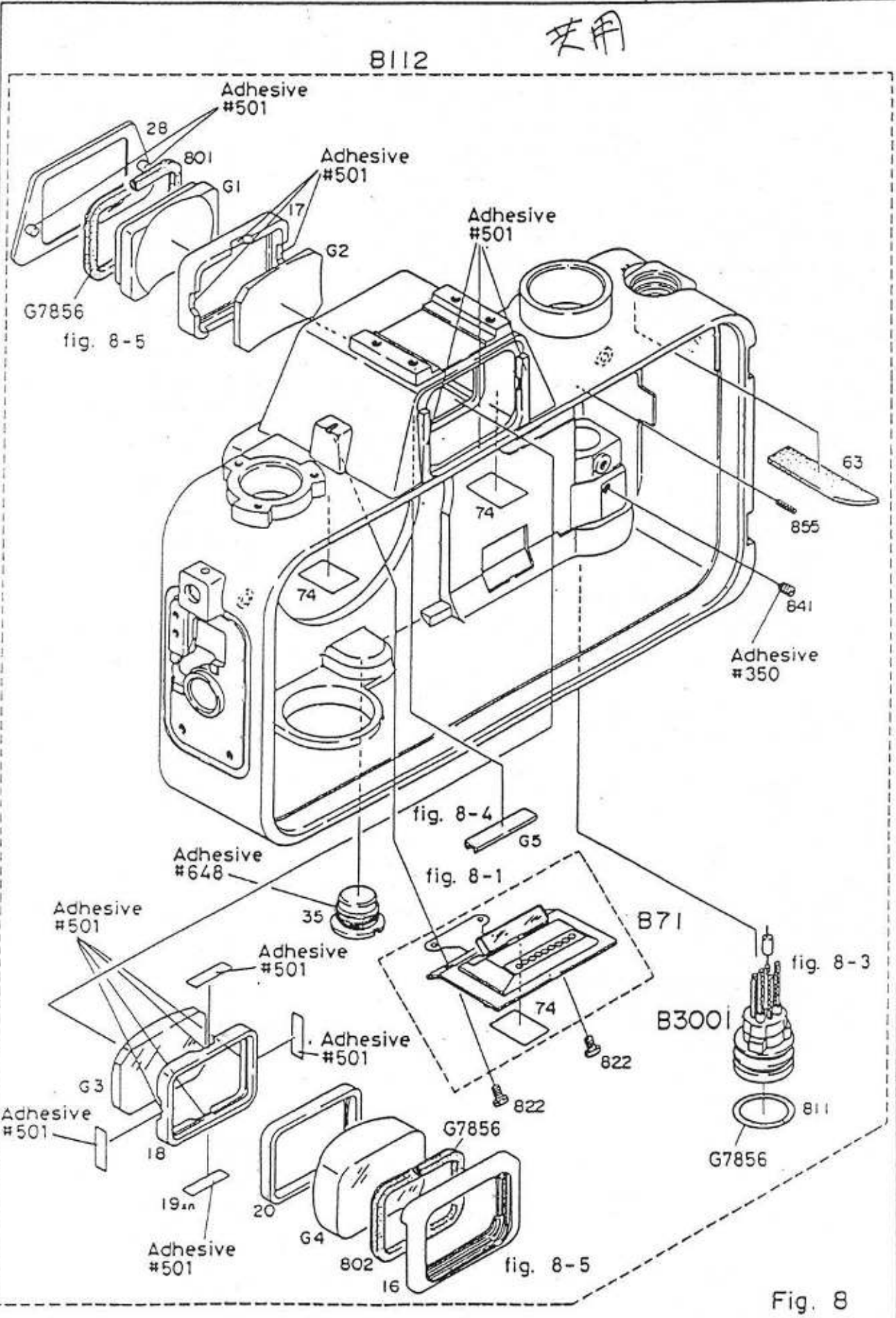
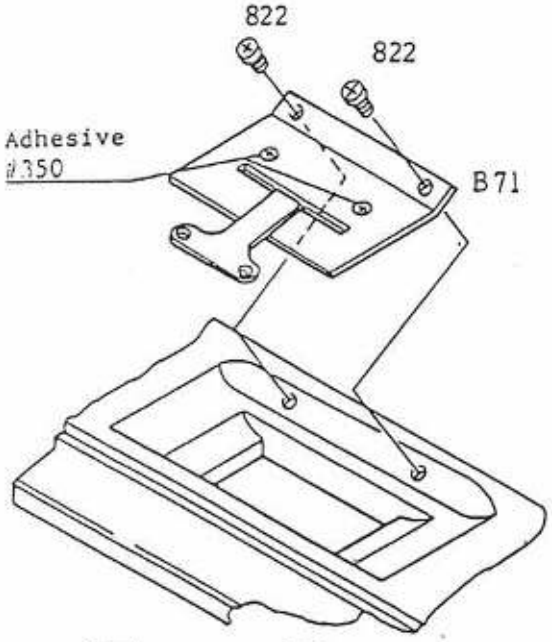
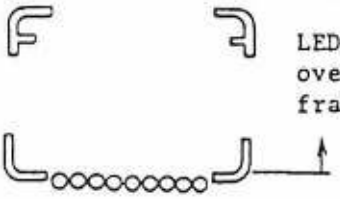

実用
B112
Adhesive #501
28
801
G1
Adhesive #501
17
G2
Adhesive #501
G7856
fig. 8-5
63
74
855
74
841
Adhesive #350
fig. 8-4
G5
Adhesive #648
35
fig. 8-1
B71
Adhesive #501
Adhesive #501
74
822
fig. 8-3
B3001
Adhesive #501
G3
822
811
Adhesive #501
18
G7856
G7856
19an
20
G4
802
16
Adhesive #501
fig. 8-5

Fig. 8

Fig.8-1 LED panel position



LED panel should be visible.
To adjust, loosen #843 x 2 and change the installed position of B71.



LED should not extend over the viewfinder frame

Fig.8-2 Sync terminal wires

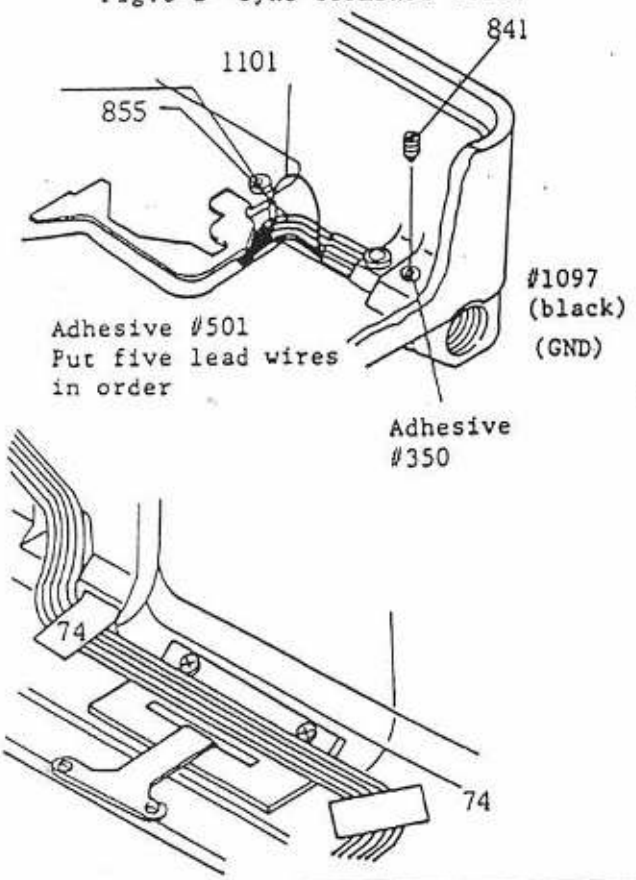


Fig.8-3 Sync terminal

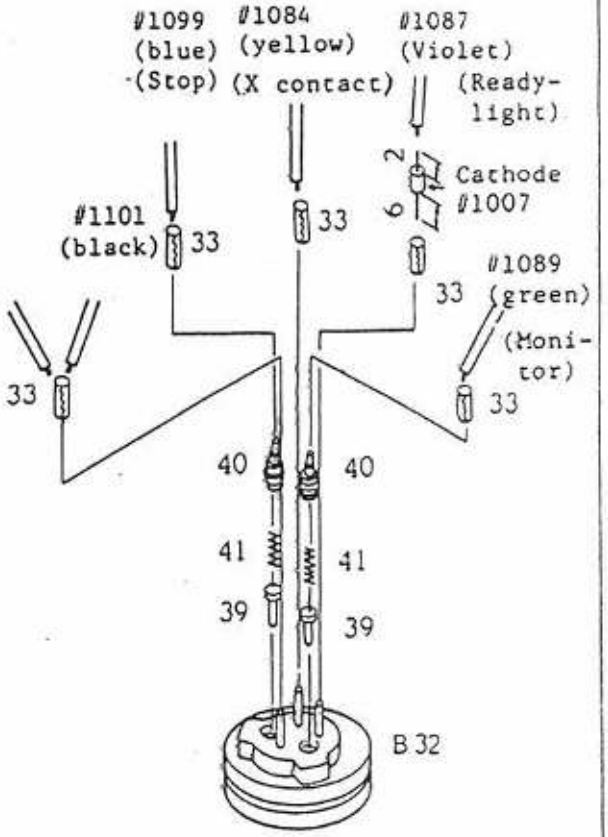
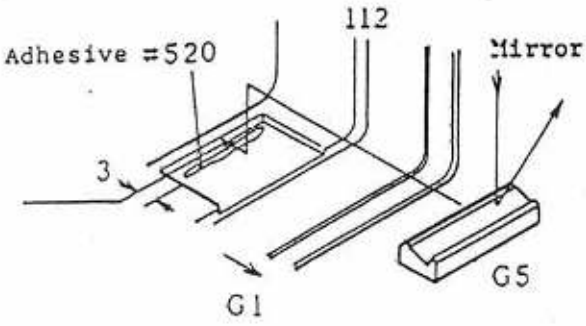


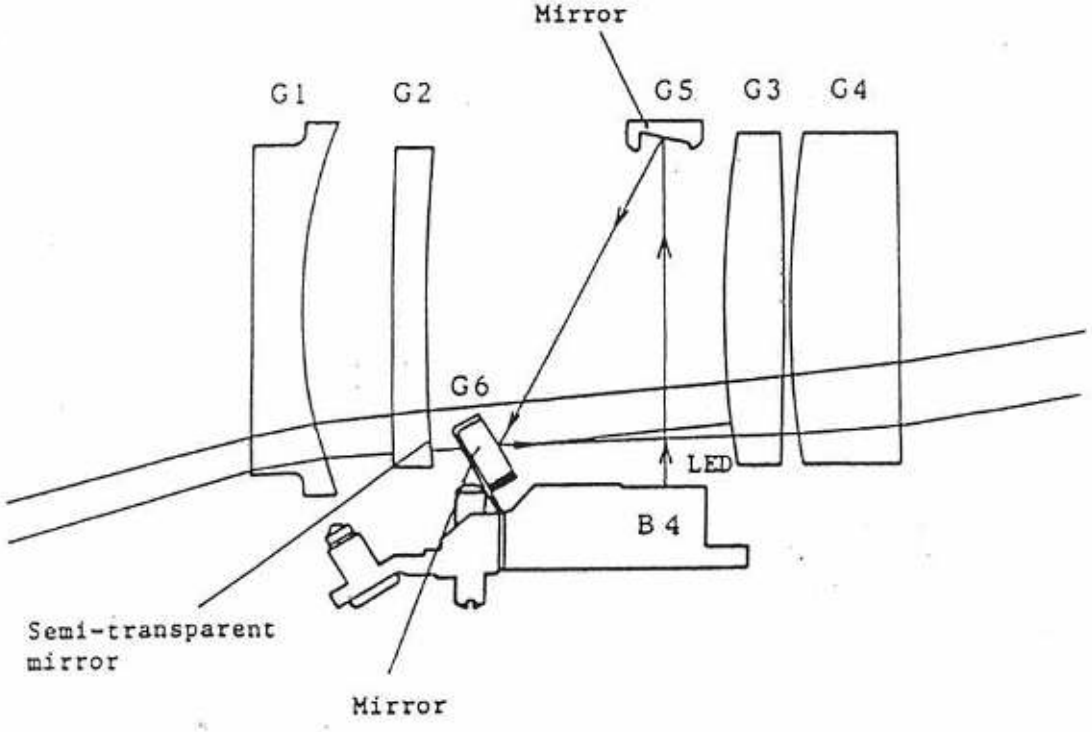
Fig.8-4 Mirror G5 installation



1) Apply adhesive material on the area of within 3mm from the step.

2) Mirror should face G1.

Fig.8-5 Viewfinder optical construction



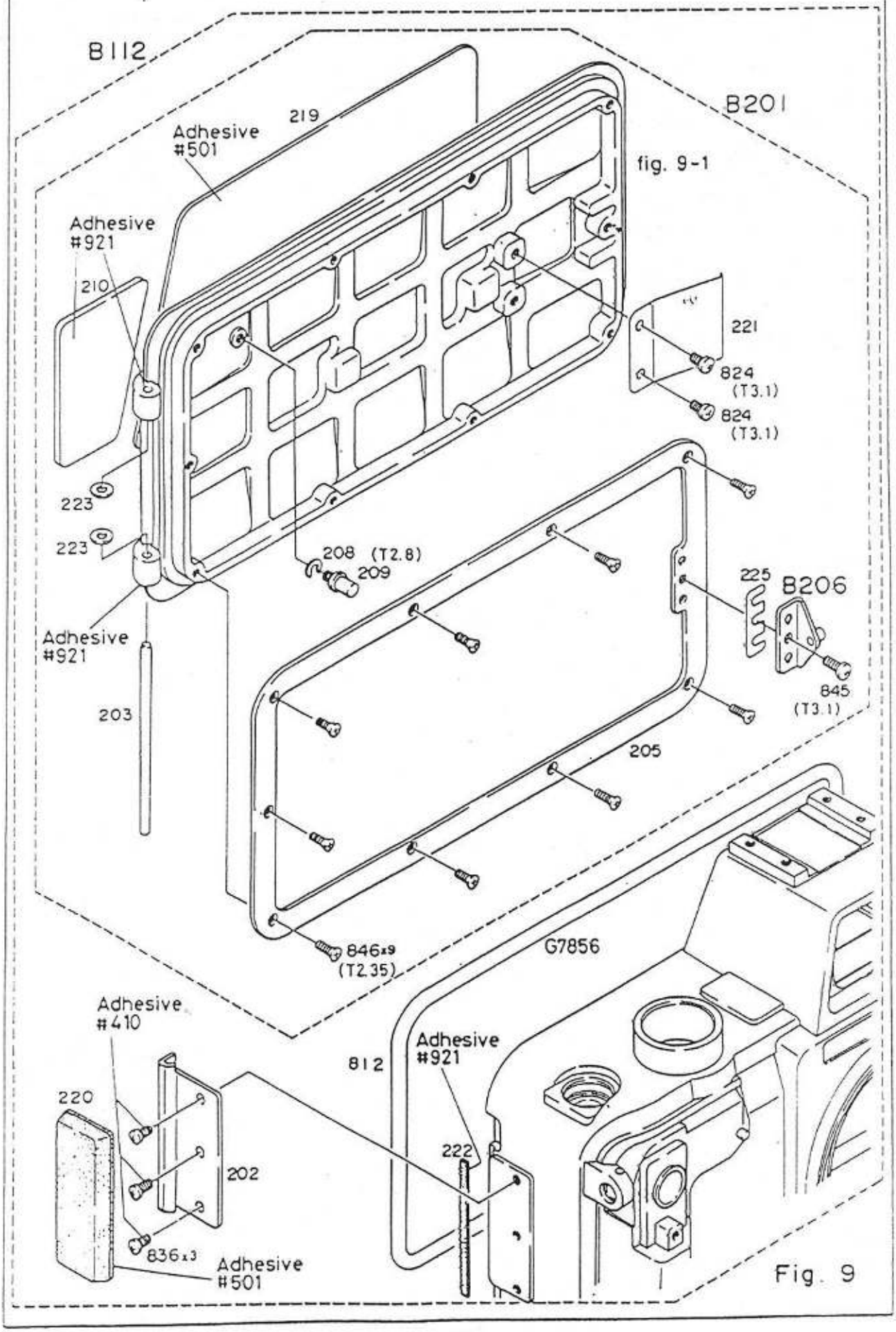
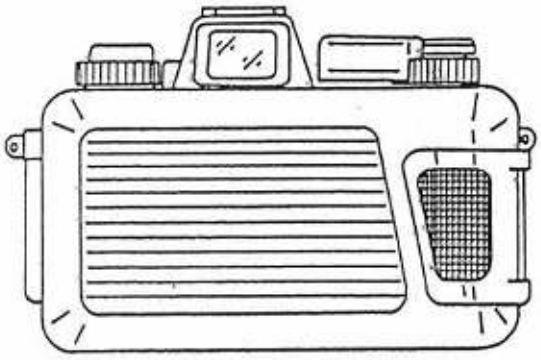

B112
B201
219
Adhesive
#501
fig. 9-1
Adhesive
#921
210
221
824
(T3.1)
824
(T3.1)
223
223
208 (T2.8)
209
225
B206
845
(T3.1)
Adhesive
#921
203
205
846x9
(T2.35)
G7856
Adhesive
#410
812
Adhesive
#921
220
222
202
836x3
Adhesive
#501

Fig. 9

Fig.9 Camera back



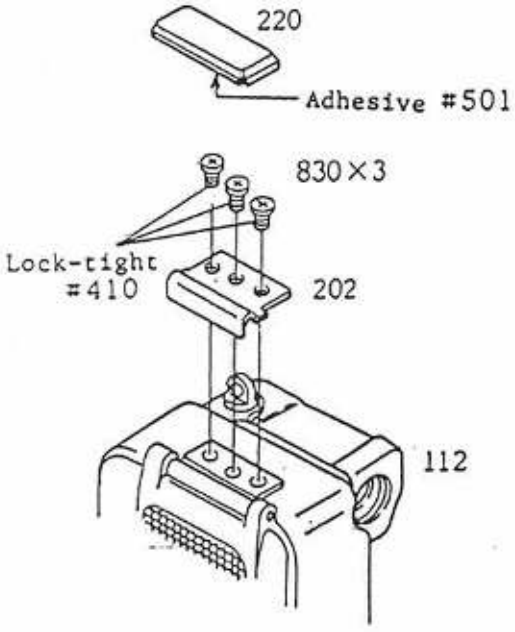
1) Fit B201 with B112.

2) With #211 depressed, screw B213 clockwise.

3) Tighten #836 x 3 to fix #202.

4) Cement #202 with adhesive material #501.

Be sure to install B201 before fixing #202.



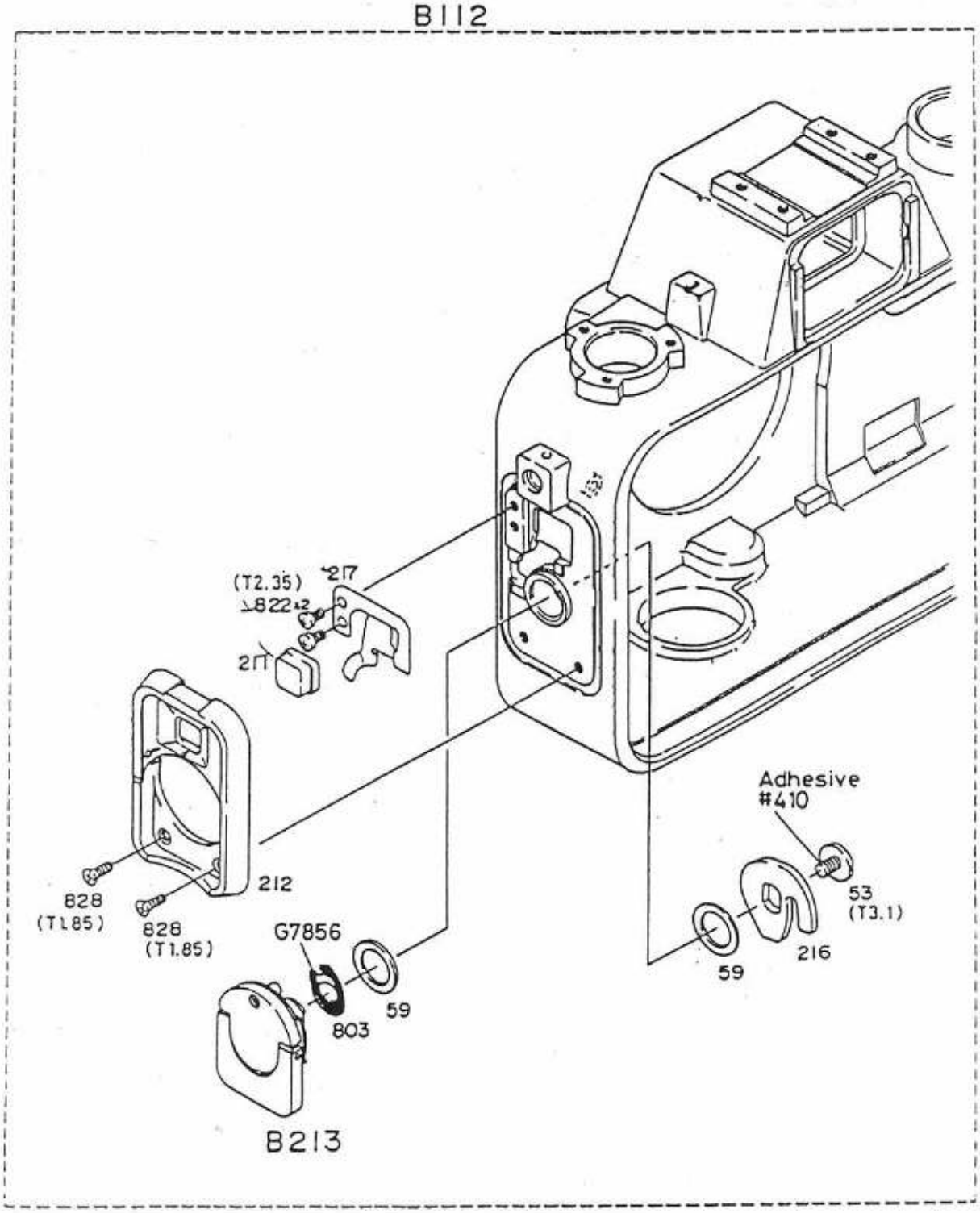

B112
(T2.35)
822
217
217
212
828
(T1.85)
828
(T1.85)
G7856
803
59
B213
Adhesive
#410
53
(T3.1)
216
59

Fig. 10

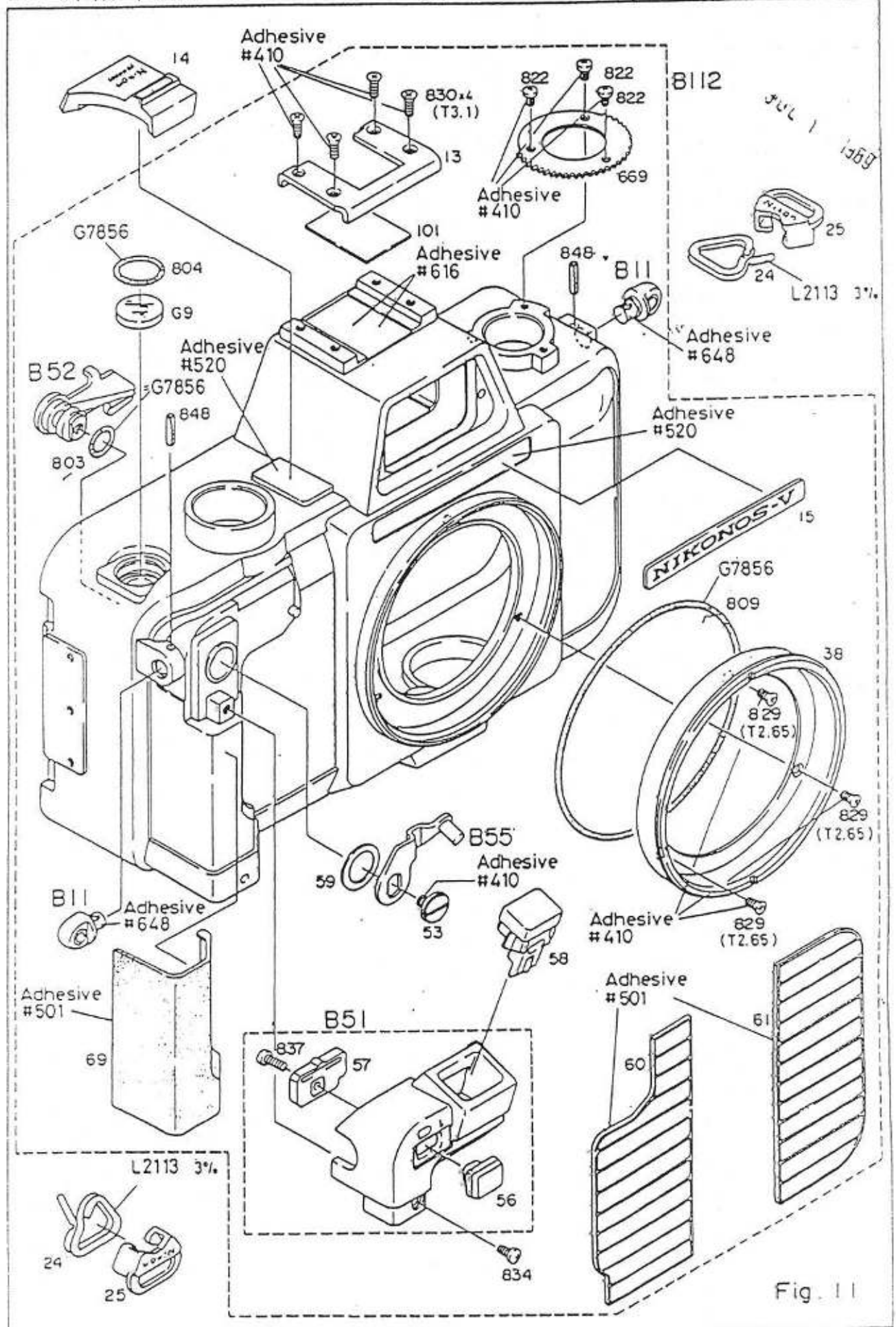
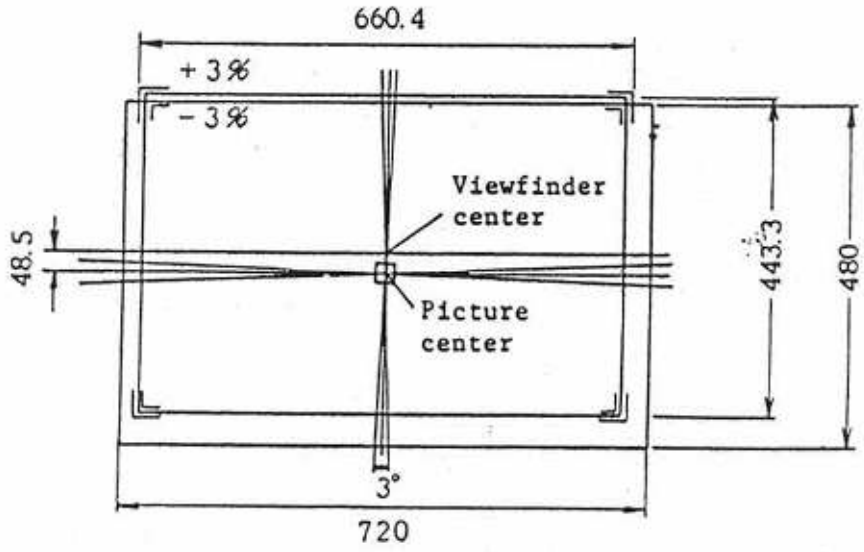

Adhesive #410
14
830×4 (T3.1)
13
822
822
822
669
B112
Adhesive #410
101
G7856
804
G9
Adhesive #616
848
B11
25
24
L2113 3%
Adhesive #648
B52
G7856
Adhesive #520
848
803
Adhesive #520
NIKONOS-V
15
G7856
809
38
829 (T2.65)
829 (T2.65)
B55
Adhesive #410
59
53
B11
Adhesive #648
Adhesive #410
829 (T2.65)
58
Adhesive #501
69
B51
837
57
Adhesive #501
61
60
56
834
L2113 3%
24
25

Fig. 11

[3] Adjustments

1. Parallax adjustments



Tool

1) Test chart J18166

2) Tripod

3) 35/2.5 lens (0.8mm focused)

4) Eyepoint viewer J15205

5) Focusing screen J18033

1) Mount camera in test onto tripod and hold shutter open.

2) Set J18033 to camera.

3) Use J15205 to check the alignment of viewfinder frame with test chart.

4) Add or remove #19 to adjust the alignment.

5) Apply adhesive material (#501) to fix #19.

Test chart J18087 for the former IV-A camera is not usable except the alignment of viewfinder center.

2. Shutter speed adjustments

2-1. Tool

1) Shutter tester J19036

2) Time counter J18142

3) Tool lens (35mm/f5.6) J18085

4) Tool battery J15238

5) IS connector J15240

6) Screwdriver J5135

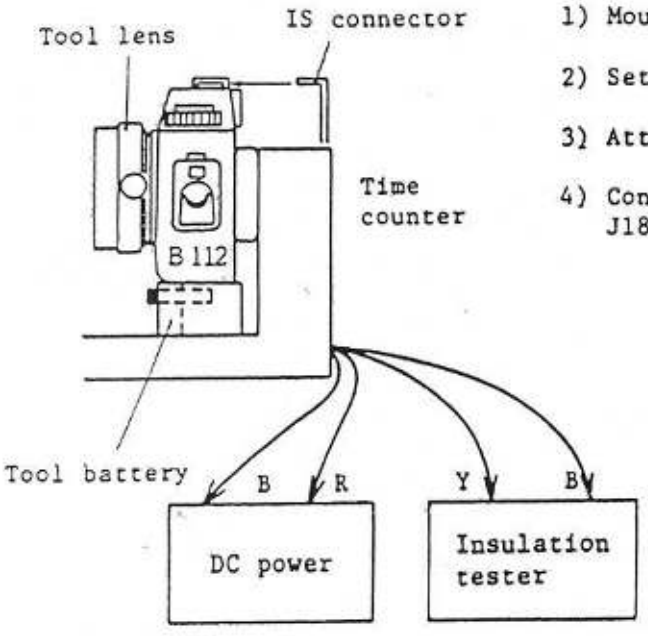
7) Test film (Fuji Neopan SS)

8) DC regulated power supply J18084 or J9001-5

9) Contact tester J19028-1

10) Digital multi-meter J9003-2

2-2. Set-up



1) Mount J18085 to camera in test.

2) Set J15238 to camera.

3) Attach J15240 to accessory shoe.

4) Connect four wires from J15238 to J18084 and J19028-1.

2-3. Check

1) Set shutter dial to A.

2) Set shutter tester to LV12.

3) Release shutter until frame counter reaches "1".
See if LED will not light up and shutter speed is fixed at 1/500 sec. during those releases.

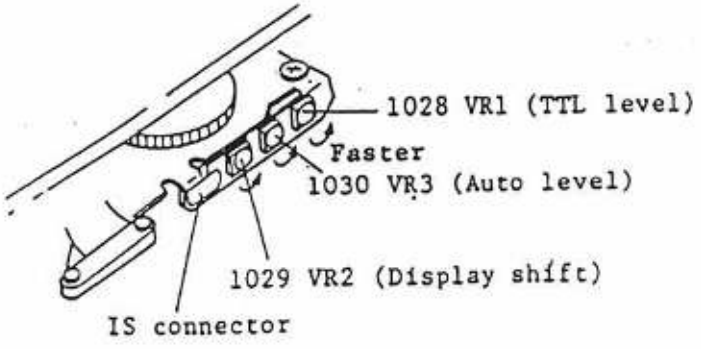
4) After frame counter reaches "1", see if depressing release button halfway lights LED up.

5) See if shutter speeds can be delivered responding to the light.

6) Set DC power to 2.29V. See if depressing release button halfway lights LED up.

7) Set DC power to 2.56V. See if LED continue to light for 16 sec. after finger is taken off release button.

2-4. Adjustment



1) Auto level

Adjustments can be made by turning VR3. Set DC power to 3V. Turn VR3 counter clockwise to accelerate shutter speeds.

LV	ISO	Standard(ms)	Tolerance(ms)
12	100	7.81	7.05 - 8.66

Step	LV	ISO	Standard(ms)	Tolerance(ms)
1	12	25	31.25	25.4 - 38.4
2	"	800	0.98	0.74 - 1.28
3	9	1600	3.91	3.17 - 4.80
4	"	200	31.25	25.4 - 38.4
5	15	100	0.98	0.74 - 1.28
6	"	25	3.91	3.17 - 4.80

2) Manual shutter speed

Step	LV	Shutter dial	Standard(ms)	Tolerance(ms)
1	12	1/30	31.25	25.4 - 38.5
2	"	1/125	7.81	6.34 - 9.62
3	"	1/1000	0.98	0.69 - 1.39

3) Display shift

Adjustments can be made by turning VR2. Counter clockwise to increase the shift.

LV	ISO	Tolerance	
12	100 + 1/3	1/125 ON	Near to light 1/250

Step	LV	ISO	Tolerance	
1	12	400	1/500 ON	1/500, 1/250 ON
2	"	25	1/30 "	▶ ON
3	9	800	1/125 "	1/125, 1/60 ON
4	"	200	1/30 "	▶ ON
5	15	100	1/1000 "	1/1000, 1/500 ON
6	"	25	1/250 "	1/250, 1/125 ON

4) TTL level

1) Turn J18142 on to set automatic sync speed 1/90 sec.

2) Set shutter dial to A and then 1/125 - 1/1000 sec.
Standard: 11.1ms (9.02 - 13.67 ms)

3) See if ready-light LED lights up.

It is normal that automatic sync speed 1/90 sec. is not displayed on LED panel.

Load camera with a test film (Fuji Neopan SS or equivalent). Adjustments can be made by turning VR1. Counter clockwise to accelerate sync speed.

LV	ISO	Tolerance (μs)	LED display
15	100	Standard (μs) 820	1/1000 BLINK Ready-light ON

Notes:

1) Ready-light will turn on when release button switch halfway depressed.

2) If LED of J18142 is off, press reset button.

3) Standard reflector J15196 is less accurate than Fuji Neopan SS in this check.

5) M90 check

Standard: 9.0 - 14.0ms

6) Synchronization check

Time lag: 0.3 - 1.2ms
After sync on: 1.5ms or more
Contact efficiency: 50% or more
Insulation resistance: 30MΩ or more

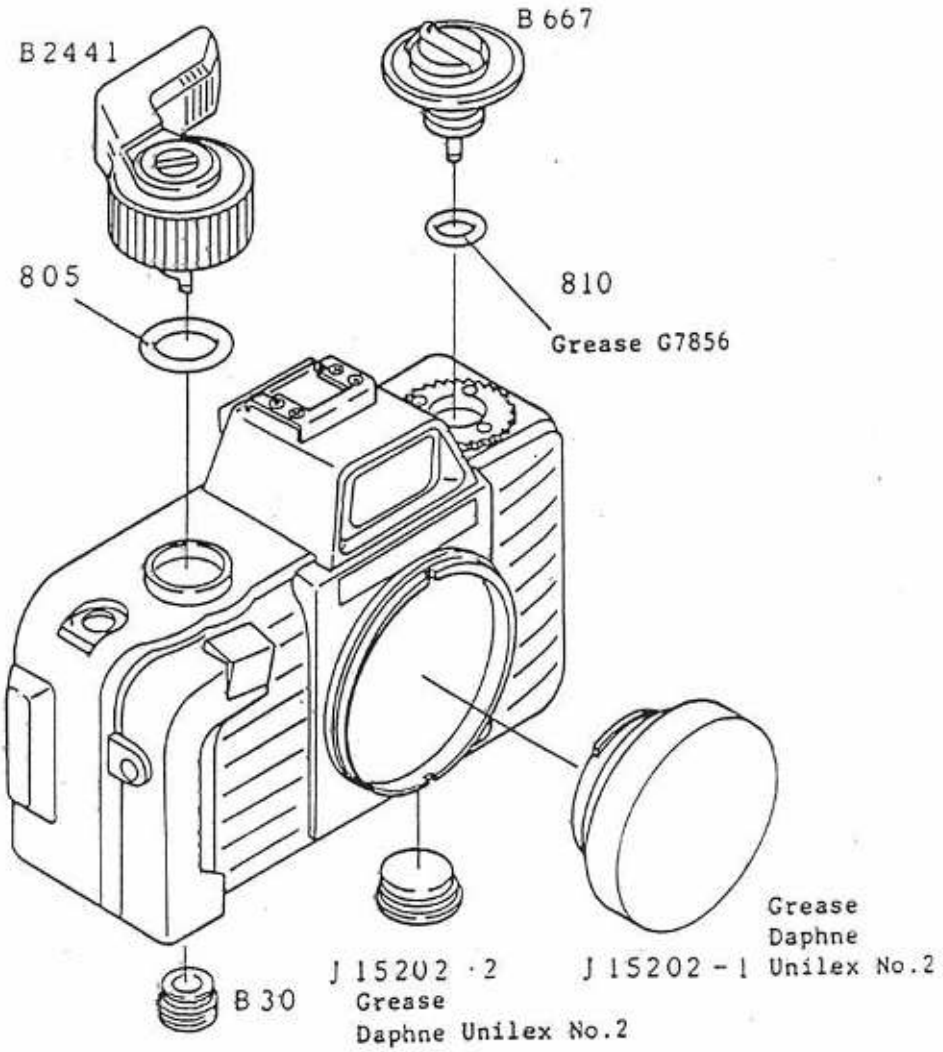
3. Outer housing waterproof test

Tool

1) Water tank J18026-1
2) Waterproof cap J15202-1
   - ditto - J15202-2
   - ditto - (J15202-4)
   - ditto - (J15241)

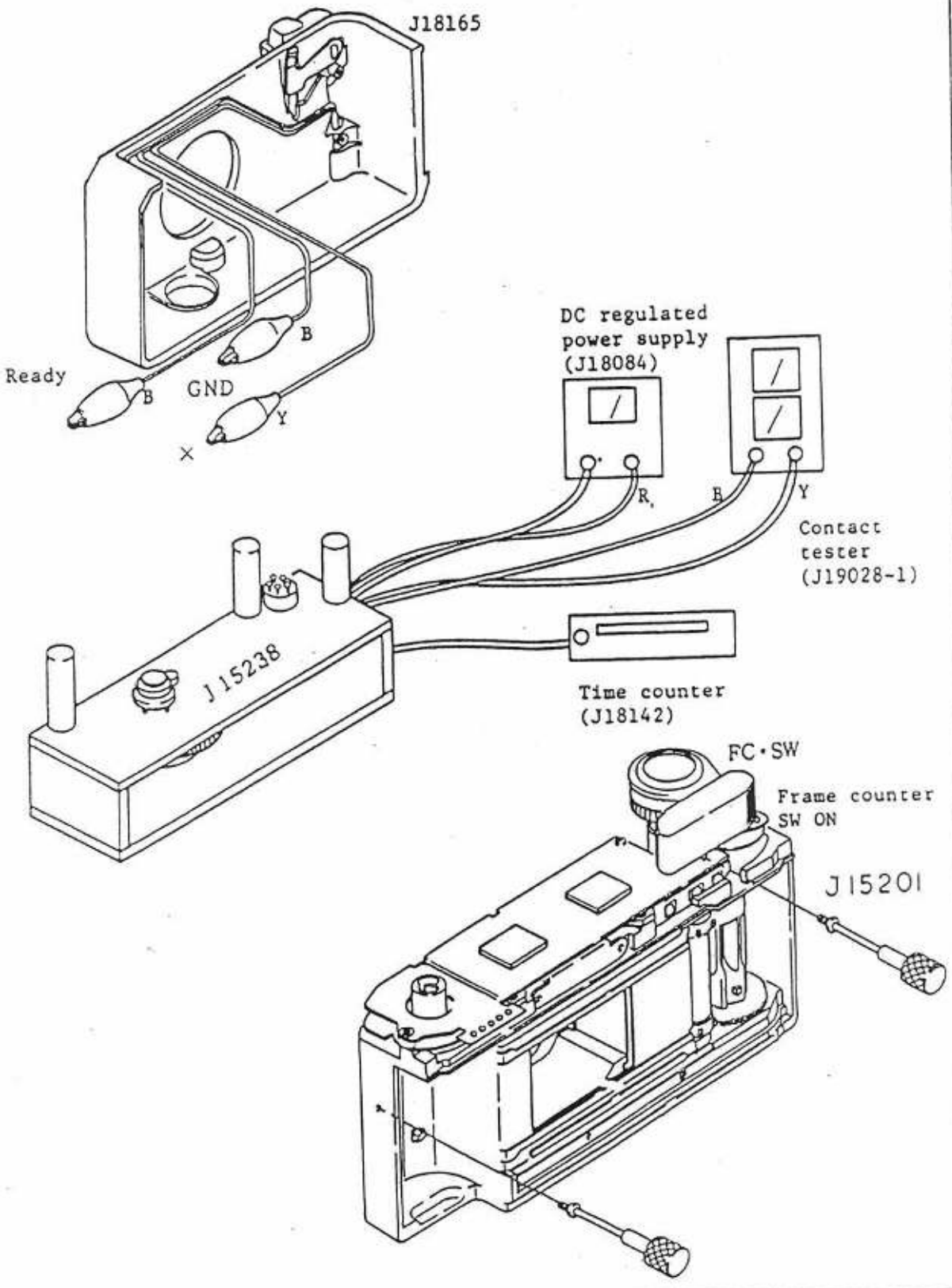
Install Film-advance lever B2441, Rewind knob B667, Sync terminal cap B30, O-ring #805, O-ring #810, Caps J15202-1 and J15202-2 to outer housing in test.

1) Put outer housing in water tank and apply a pressure of 5kgcm^2 gradually; it should take 30 sec. or more to apply pressure.
2) Leave outer housing pressured for 30 min.
3) Relieve pressure gradually; it should take 30 sec. or more.



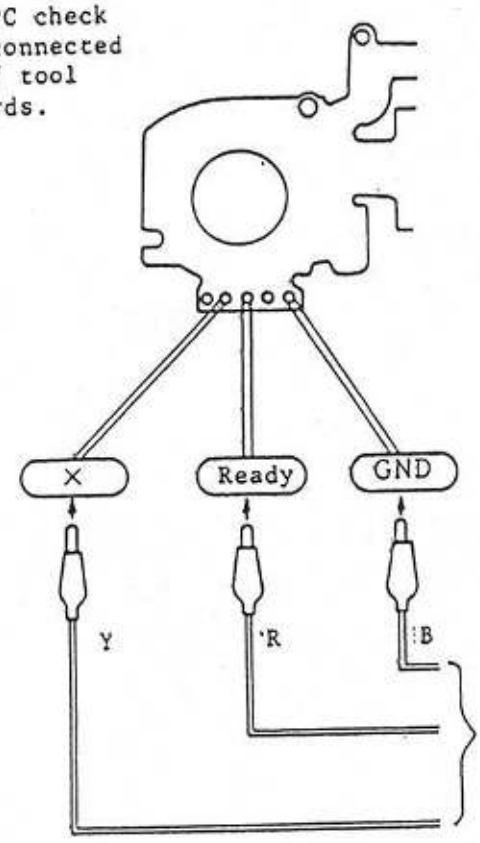
4. Tool battery and tool outer housing

4-1. Set-up



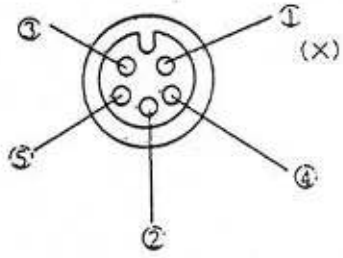
4-2. FPC check lands

Use three lead wires to be soldered to FPC check lands and to be connected with each clip of tool outer housing cords.



Sync terminal

1) X contact
2) GND contact
3) Ready-light contact
   Automatic sync speed set
4) TTL stop signal contact
5) Monitor contact



ELECTRIC CIRCUIT

Contents Page

[1] WIRING DIAGRAM E1

[2] CIRCUIT DIAGRAM E2

[3] CHECKING LANDS E3

[4] CIRCUITRY PARTS PLAN E6

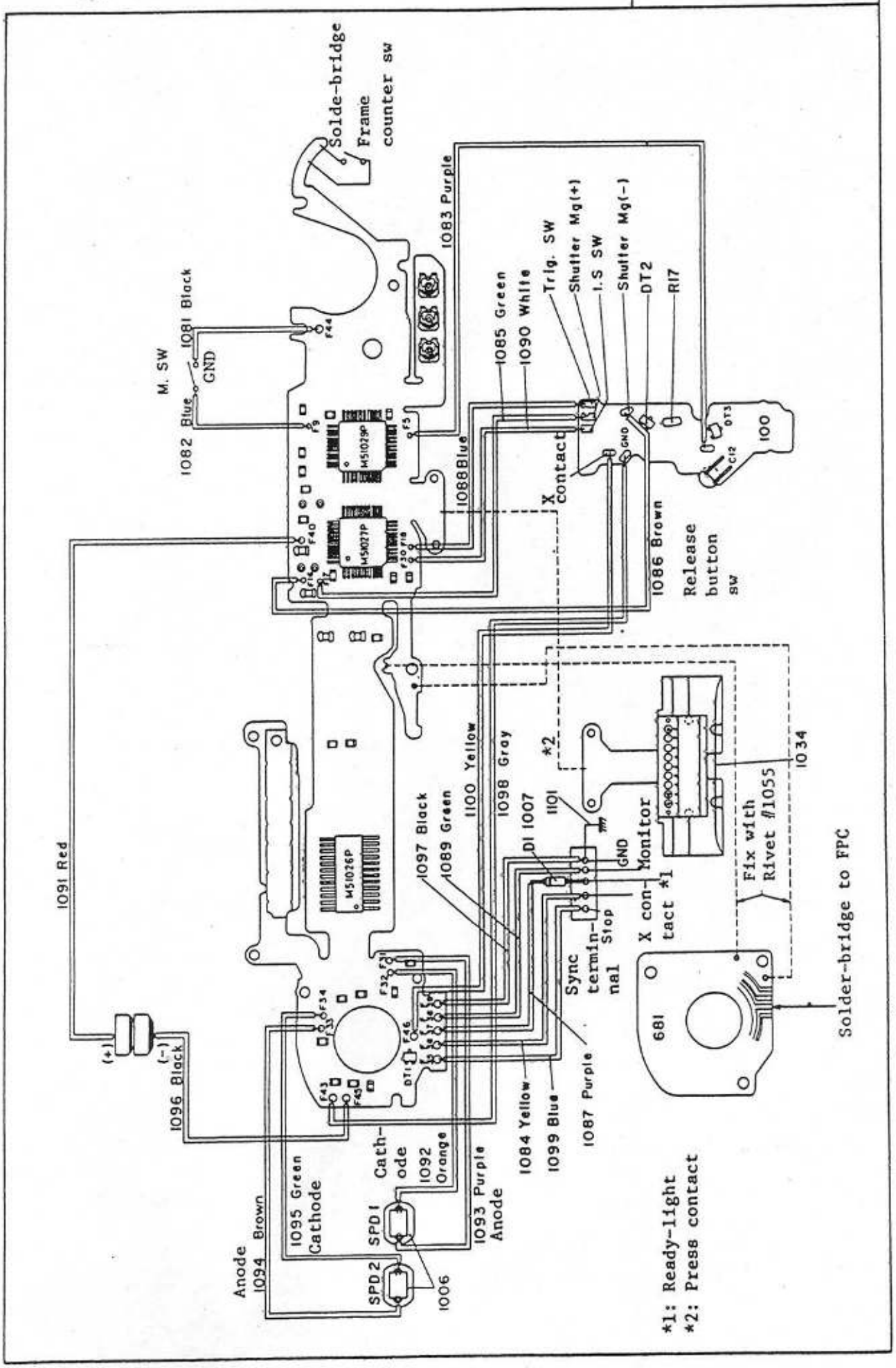
[5] SHUTTER UNIT CIRCUIT PATTERN E7

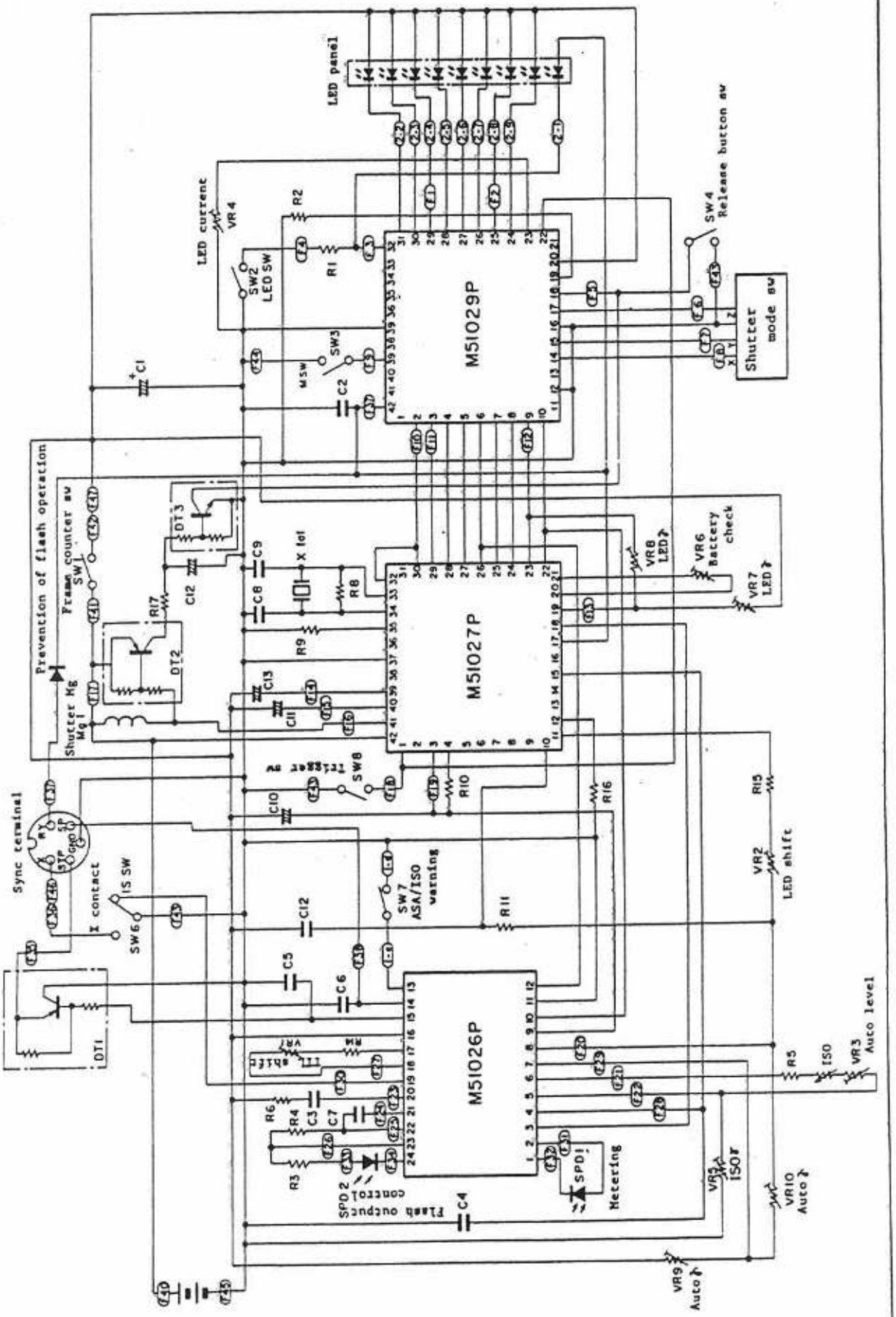
[6] CIRCUITRY OUTLINES

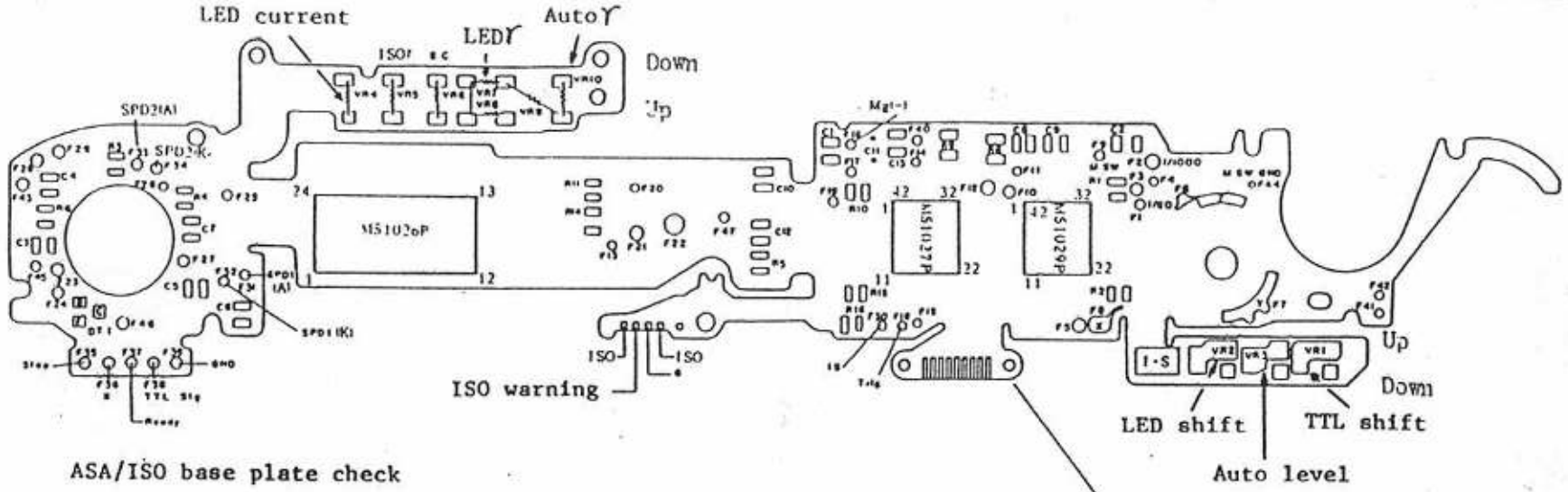
1. Abbreviations E8
2. LED/Power/Shutter Control E9
3. Metering block E10
4. Shutter control block E11
5. Release button switch delay block E12
6. LED driver block E14
7. TTL flash output control block E15
8. Battery checker block E17
9. Oscillation block E18
10. Timing chart E19
11. Gray code table E22

[7] TROUBLESHOOTING FLOWCHART C1

FEA04051-R.3145.A




LED panel
LED current
VR4
SW2
LED SW
SW3
SW4
Release button sw
Shutter
mode sw
M51029P
M51027P
M51026P
Prevention of flash operation
Frame counter sw
SW1
Shutter Mg
Mg1
DT1
DT2
DT3
X tal
SW8
Sync terminal
X contact
SW6
1S SW
SW7
ASA/ISO
warning
VR2
LED shift
VR3
Auto level
VR5
ISO
VR6
Battery
check
VR7
VR8
LED
VR9
Auto
VR10
Auto
SPD1
Metering
SPD2
control
Flash output
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
C13
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
R11
R15
R16

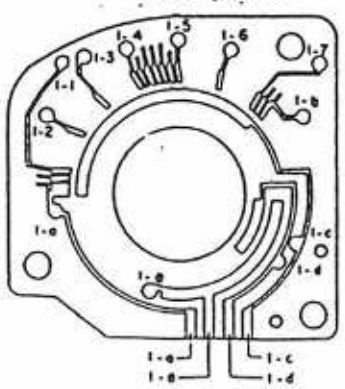


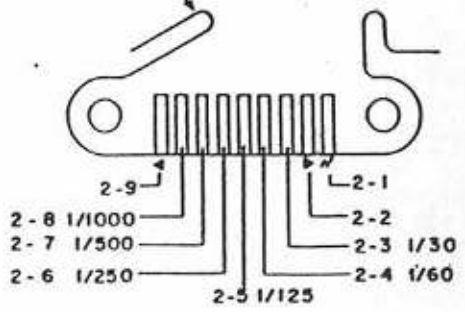
ASA/ISO base plate check

1) Check lands 1 - a 1 - b = 6k Ω
2) Check lands 1 - 1 1 - 7 = 5.4k Ω
3) Check lands 1 - b 1 - 7 = 0.3k Ω
4) Check lands

Checking Land	R (KΩ)
1 - 1	0.3
1 - 2	1.2
1 - 3	2.1
1 - 4	3.0
1 - 5	3.9
1 - 6	4.8
1 - 7	5.7

ASA/ISO
base plate





FPC check lands table

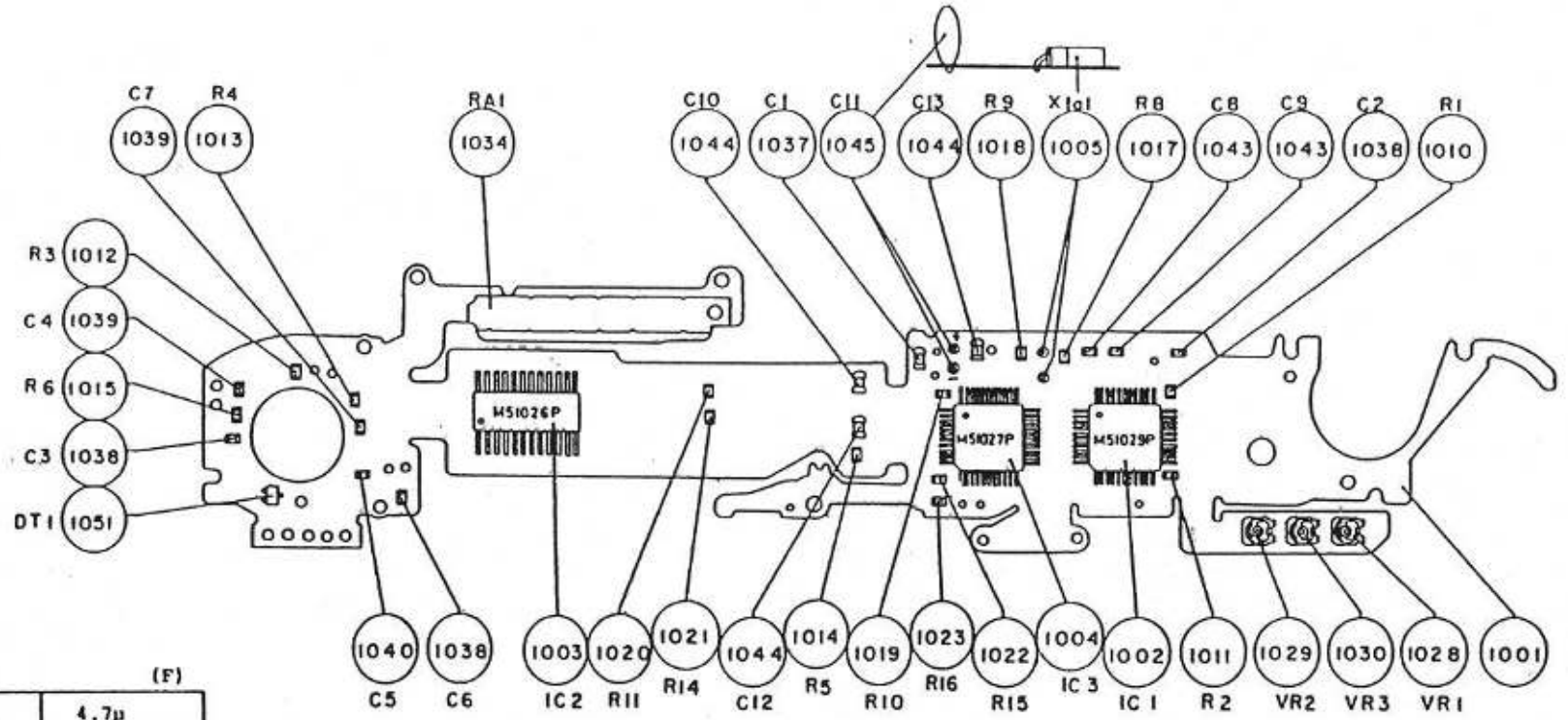
No.	Name	No.	Name
F-1	1/60 LED	F-25	Latch release
F-2	1/1000 LED	F-26	Latch release
F-3	Ready-light (cathode)	F-27	TTL shift level
F-4	LED SW	F-28	Input reference 237mv
F-5	Release button SW	F-29	Auto γ
F-6	Gray code Z	F-30	IS SW
F-7	- ditto - Y	F-31	SPD 1 Anode
F-8	- ditto - X	F-32	SPD 1 Cathode
F-9	Memory SW	F-33	SPD 2 Anode
F-10	LED TVs	F-34	SPD 2 Cathode
F-11	Clock pulse	F-35	TTL stop signal
F-12	LED A/D	F-36	X (sync terminal)
F-13	LED γ	F-37	Ready-light signal
F-14	Memory condenser	F-38	TTL monitor signal
F-15	LED filter condenser	F-39	Flash GND
F-16	Shutter Mg(-)	F-40	Vcc (battery)
F-17	Shutter Mg(+)	F-41	Vcc (frame counter SW)
F-18	Trigger SW	F-42	Vcc'
F-19	Timer condenser	F-43	Shutter GND
F-20	TVo	F-44	Memory switch GND
F-21	VISO	F-45	Battery GND
F-22	ISO γ	F-46	X (Shutter)
F-23	Integrating condenser input	F-47	Vcc'
F-24	Latch release		

ASA/ISO check lands table

No.	Name	No.	Name
1-a	ISO (a)	1-2	ISO 800
1-b	ISO (b)	1-3	ISO 400
1-c	ISO (c)	1-4	ISO 200
1-d	ISO warning (GND)	1-5	ISO 100
1-e	ISO warning	1-6	ISO 50
1-1	ISO 1600	1-7	ISO 25

LED panel check lands table

No.	Name	No.	Name
2-1	Ready-light	2-6	1/250 LED
2-2	Underexposure warning	2-7	1/500 LED
2-3	1/30 LED	2-8	1/1000 LED
2-4	1/60 LED	2-9	Overexposure warning
2-5	1/125 LED		

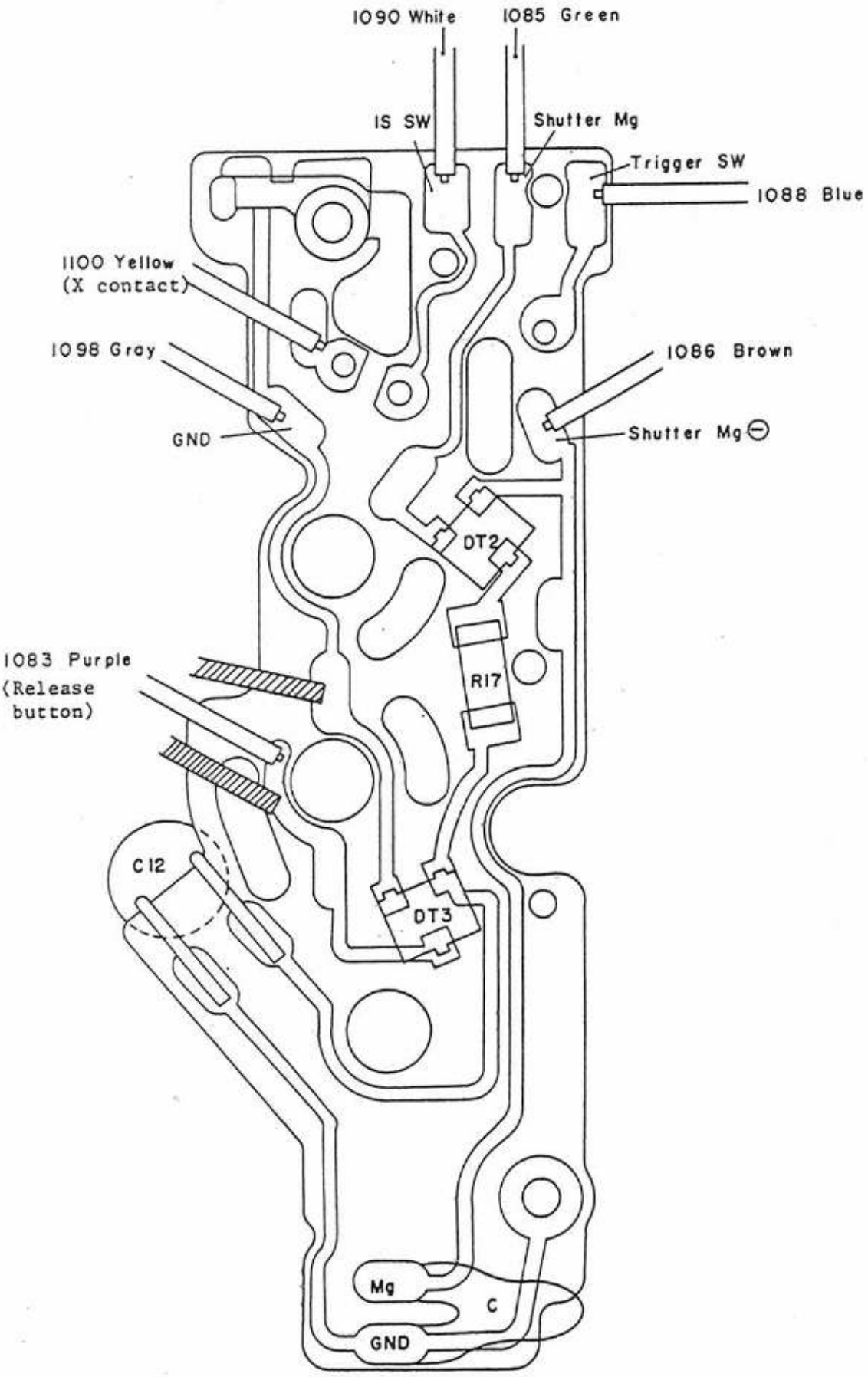


(F)

C1	4.7μ
C2	0.01μ
C3	0.01μ
C4	0.022μ
C5	2200P
C6	0.01μ
C7	0.022μ
C8	15P
C9	15P
C10	1μ
C11	10μ
C12	1μ
C13	1μ

(Ω)

R1	2K	R9	4.7M
R2	82K	R10	180
R3	4.7K	R11	1.0K
R4	150K	R14	20K
R5	10K	R15	2.4K
R6	1.5K	R16	2.7K
R8	3.3M	R17	470


1090 White
1085 Green
IS SW
Shutter Mg
Trigger SW
1088 Blue
1100 Yellow
(X contact)
1098 Gray
1086 Brown
GND
Shutter Mg ⊖
DT2
R17
1083 Purple
(Release
button)
C12
DT3
Mg
C
GND

[6] Circuitry outlines

1. Abbreviations

(1) Check land

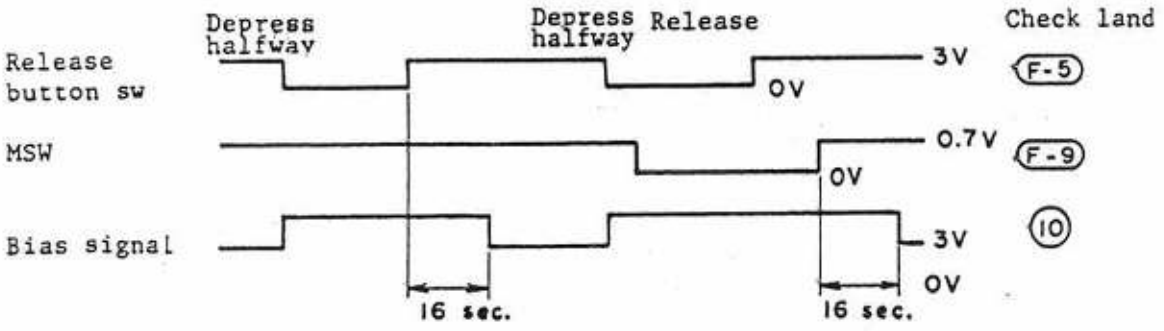
F - (No.) ----- FPC (B2001)
A - (No.) ----- IC (1003) M51026
B - (No.) ----- IC (1004) M51027
○ ----- IC (1002) M51029
1 - (No.) ----- ASA/ISO base plate
2 - (No.) ----- LED panel

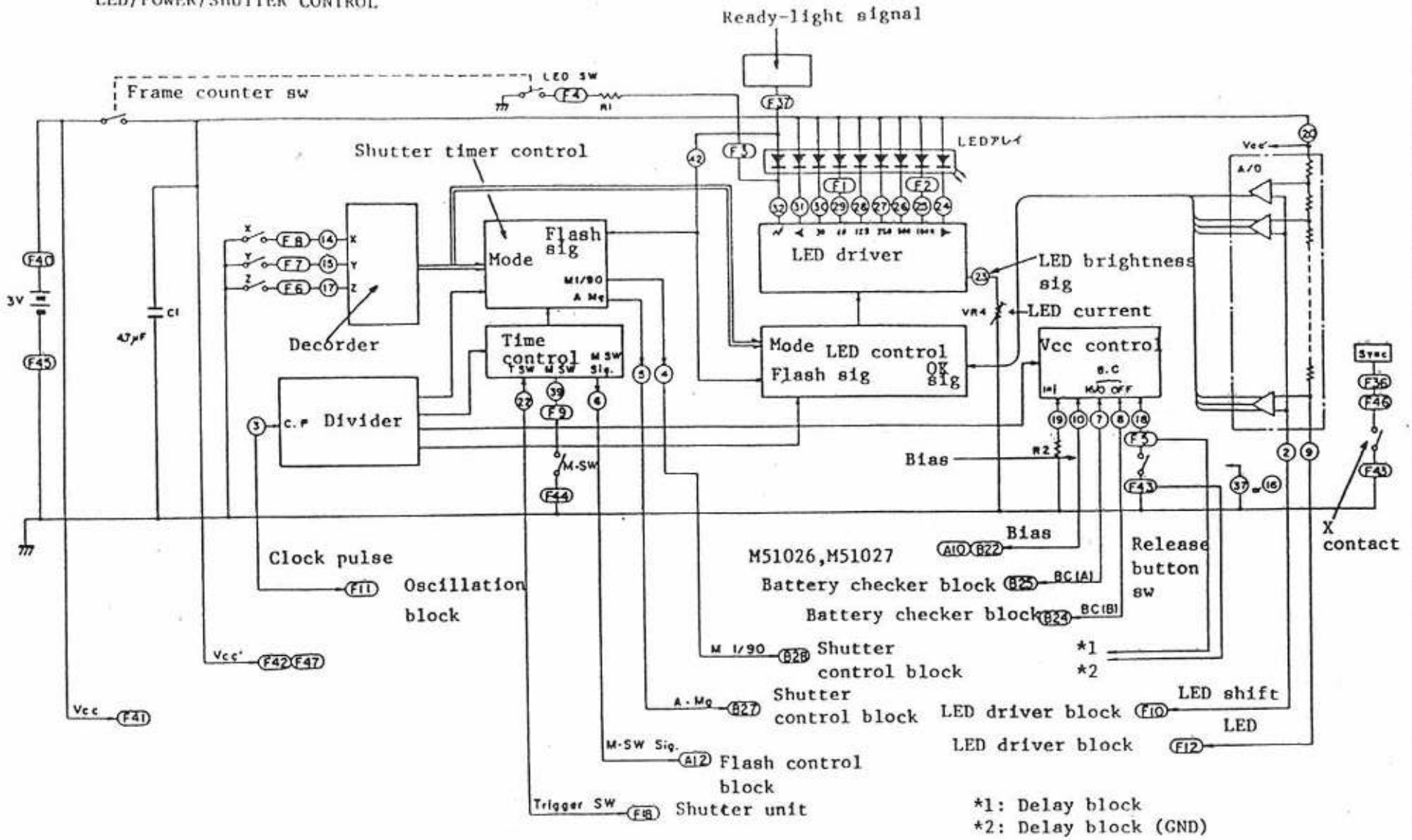
(2) Switch/signal

FC. SW	-----	Frame counter switch (Auto, Manual: ON, M90, B: OFF)
LED SW	-----	Ready-light switch (Auto, Manual: OFF, M90, B: ON)
Vcc	-----	Battery voltage 3V
Vcc'	-----	Battery voltage 3V supplied when FC.SW is ON
Mg	-----	Magnet
A. Mg	-----	Auto magnet signal
M1/90Mg	-----	Manual.1/90 magnet signal
MSW sig	-----	Memory switch signal
BC	-----	Battery check
TSW	-----	Trigger switch
IS.SW	-----	Integrating switch

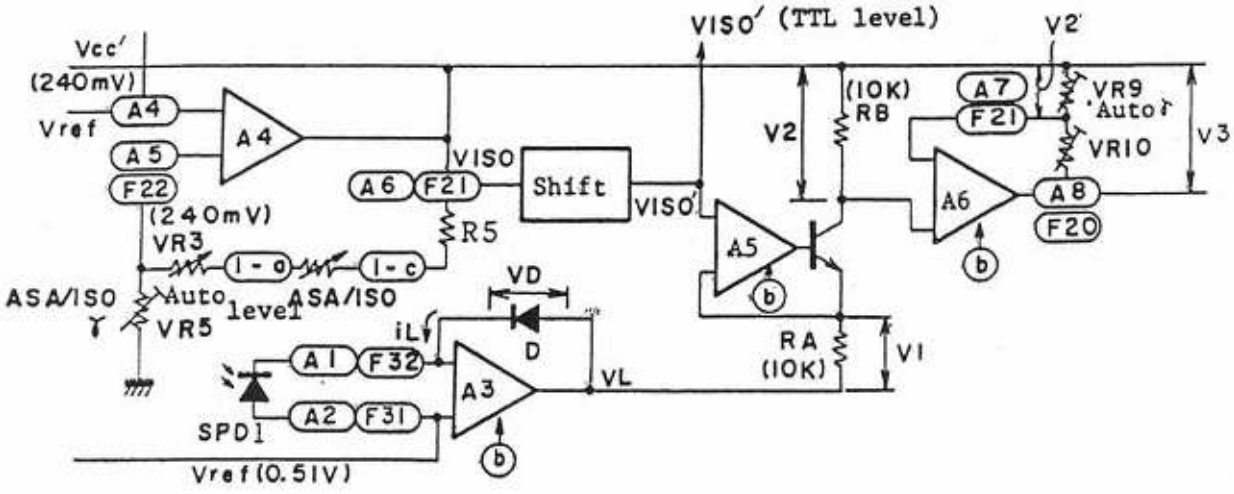
(3) Meter hold

Depressing release button halfway turns release button SW on. Bias signal goes high and the circuitry becomes operative. Bias signal remains high for 16 sec. after either release button SW or MSW turns off.




LED/POWER/SHUTTER CONTROL
Ready-light signal
Frame counter sw
LED SW
Shutter timer control
LEDアレイ
LED driver
LED brightness sig
LED current
Mode
Flash sig
Decorder
Time control
Mode LED control
Flash sig
OK sig
Vcc control
Divider
Bias
M-SW
Clock pulse
Oscillation block
M51026,M51027
Battery checker block
Release button sw
X contact
Shutter control block
Flash control block
Shutter unit
LED shift
LED
LED driver block
*1
*2
*1: Delay block
*2: Delay block (GND)

3. Metering block



(1) Metering section

The SPD generates the current iL in response to the light available. The current iL allows the diode D to provide the voltage VD. Operation amplifier A3 converts the current iL into the voltage VL.

The voltage VL is the sum of Vref (0.51V) and VD. The voltage VD, as well as the voltage VL, shifts by 18mv per 1LV.

(2) ASA/ISO section

The resistor VR5 adjusts the current for the resistor ASA/ISO so that the voltage VISO can shift by 18mv/1LV per 0.9KΩ/film speed. The shift rate of VISO is equivalent to that of VL.

The resistor VR3 adjusts the level of VISO.

(3) Shift section

Approx. 0.6V is added to VISO and VISO becomes VISO'.

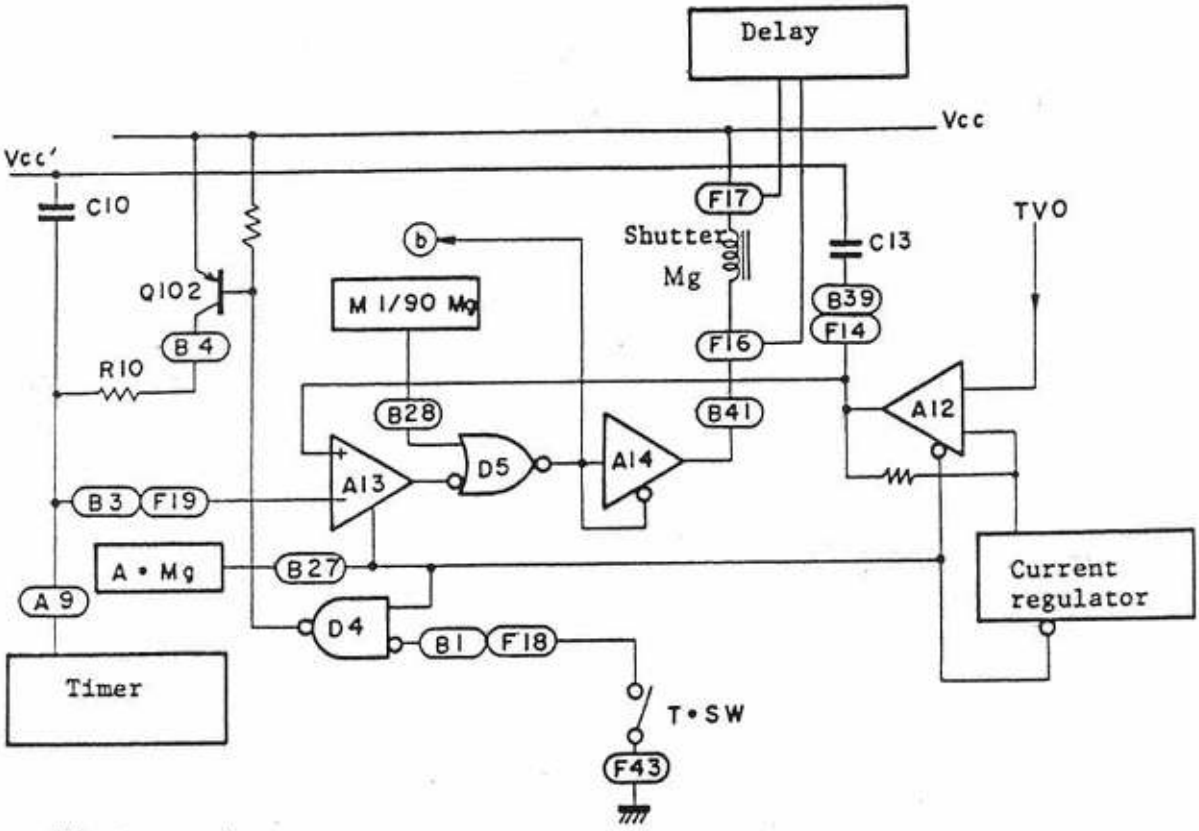
(4) Arithmetic logic

The voltage V1 is the difference between the voltages VISO' and VL at the resistor RA. The same voltage V2 and V2' are hold respectively at the resistors RB and VR9. The resistors VR9 and VR10 adjusts the voltage V3 as twice as the voltage V2'. The voltage V3 is TVO for shutter speed control.

(5) b signal (bias cutter)

During shutter release (shutter magnet charged) the b signal is L and the amplifiers A3, A5, A6 turn off.

4. Shutter control block



(1) Auto mode

When shutter is released, M.SW turns on, but A.Mg sig and M1/90Mg become H. The amplifier A12 turns off to hold the voltage TVO at the condenser C13. The comparator A13 turns on and accepts TVO at its positive terminal and the voltage near VCC at its negative terminal as the transistor Q102 is on. Thus the output voltage of A13 becomes L. The amplifier A14 turns on and its output becomes L. The shutter Mg is charged. In other words, the shutter Mg is charged when either A.Mg sig or M1/90Mg sig is H.

The travel of opening curtain turns the trigger SW off and the input and output of the diode D4 become H. Then the transistor Q102 turns off and the condenser C10 is charged. The voltage at the land B3 goes low and crosses over the voltage of the condenser C13. At the moment, the comparator becomes H. The output of the diode D5 becomes H and the amplifier A14 turns off. The shutter Mg turns off to start the travel of closing curtain.

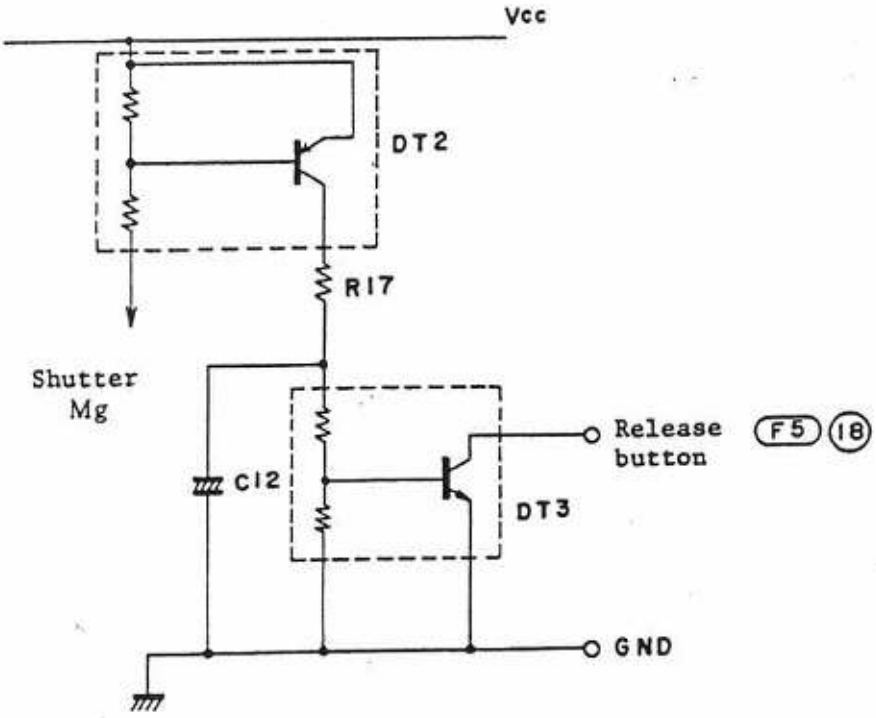
(2) Manual mode

When M.SW is ON, A.Mg sig remains L and M.1/90Mg only becomes H. So, the comparator A13 and transistor Q102 will not turn on, but the input to the diode D5 (B28) is H and the output of D5 is L. The amplifier A14 turns on and the shutter Mg is charged. The travel of opening curtain turns the trigger SW off and M1/90 Mg sig remains H as long as set in the gray code for manual shutter speed control. After this, M1/90 Mg sig turns L and the output of the diode D5 becomes H. The amplifier A14 and shutter Mg turns off to start the travel of closing curtain.

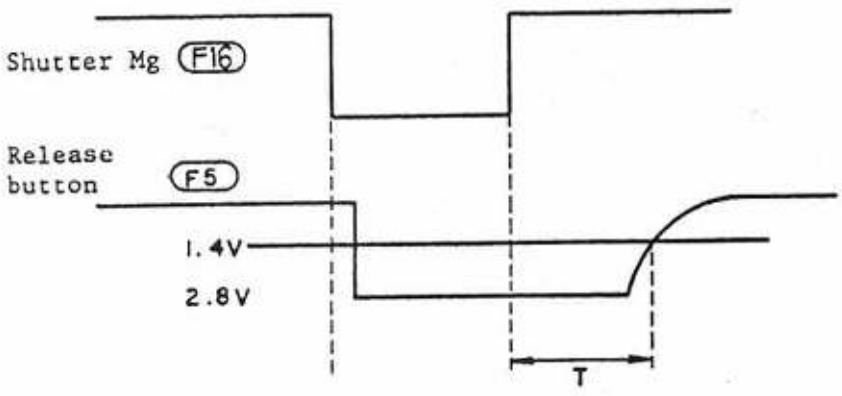
(3) b signal

On auto mode, the b signal is L while the output of the comparator A13 is L. On manual mode, the b signal is L while M1/90 Mg sig is H.

5. Release button switch delay block

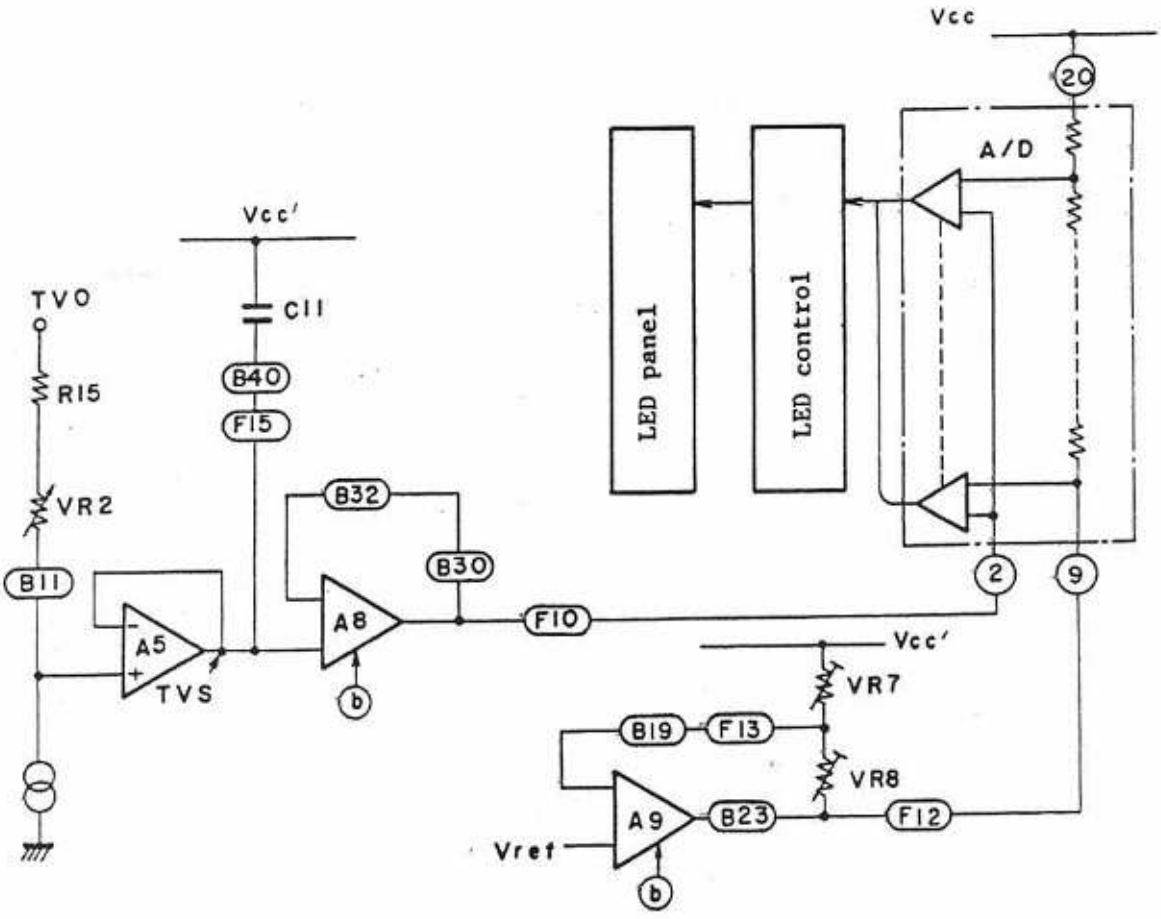


In order to ensure proper operation of slow speed shutter, this block holds release button switch on for 580ms after the shutter Mg turns off.



T = 580ms
Max = 900ms
Min = 300ms

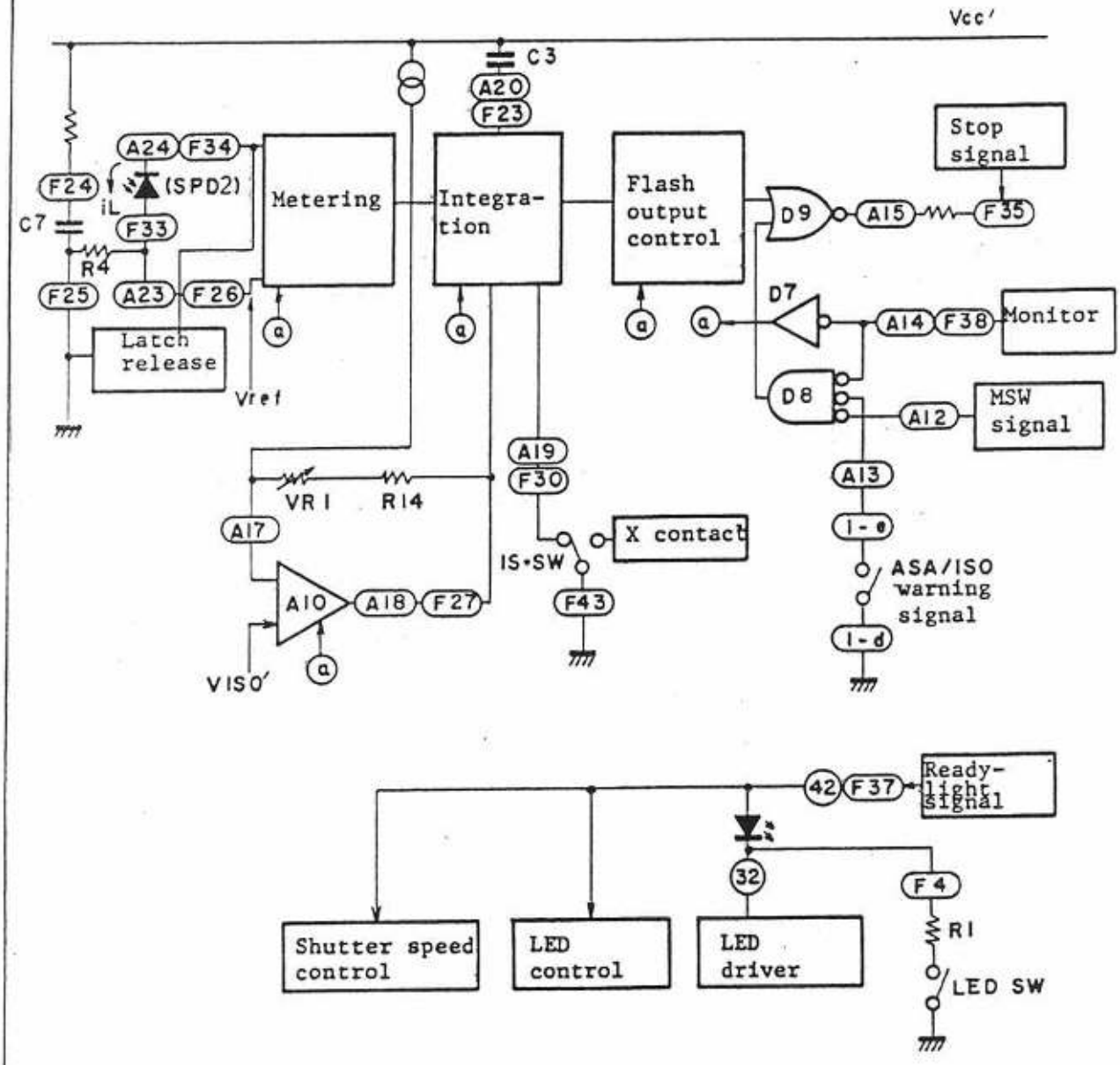
6. LED driver block



(1) The resistor VR2 shifts the voltage TVO for LED drive (TVS). The resistors VR7 and VR8 adjusts the voltages to the A/D converter.

(2) After shutter release, the M.SW turns on to cancel LED lighting. But, within 62.5 - 125ms after the M.SW turns off, the LED will light up again.

7. TTL flash output control block



(1) TTL mode

1) When the SB-102 is switched on TTL mode, the monitor signal turns L and the signal a goes H.

2) The ready-light signal allows the shutter speed control and LED control to set the sync speed (1/90 sec.) on auto mode and 1/125 - 1/1000 sec. on manual mode. The LED blinks to indicate the result of metering. But the LED 60 and 125 will not light up.

3) The ready-lights of speedlight and camera will light up at the same time. When the shutter dial is set to M90 or B, the LED SW, coupled with the FC SW, turns on to light the ready-light.

(2) Metering

1) Shutter release turns the X-contact on and fires the speedlight. The light reflected back through the lens reaches the film plane and then the TTL.SPD.

2) The TTL.SPD generates the current iL and the metering section provides the voltage in response to iL for the integration section.

(3) Integration

1) Before shutter release, the IS SW turns on to increase the voltage of the integrating condenser (A20, F23) up to VCC. After shutter release, the IS SW turns off to charge the condenser and the voltage becomes lower.

2) The lowering rate of the voltage (A20, F23) depends on the input voltage from the metering section and TTL level section (A10). If the light is strong or the film speed is fast, the output voltage of metering section is high and the voltage of condenser goes low faster.

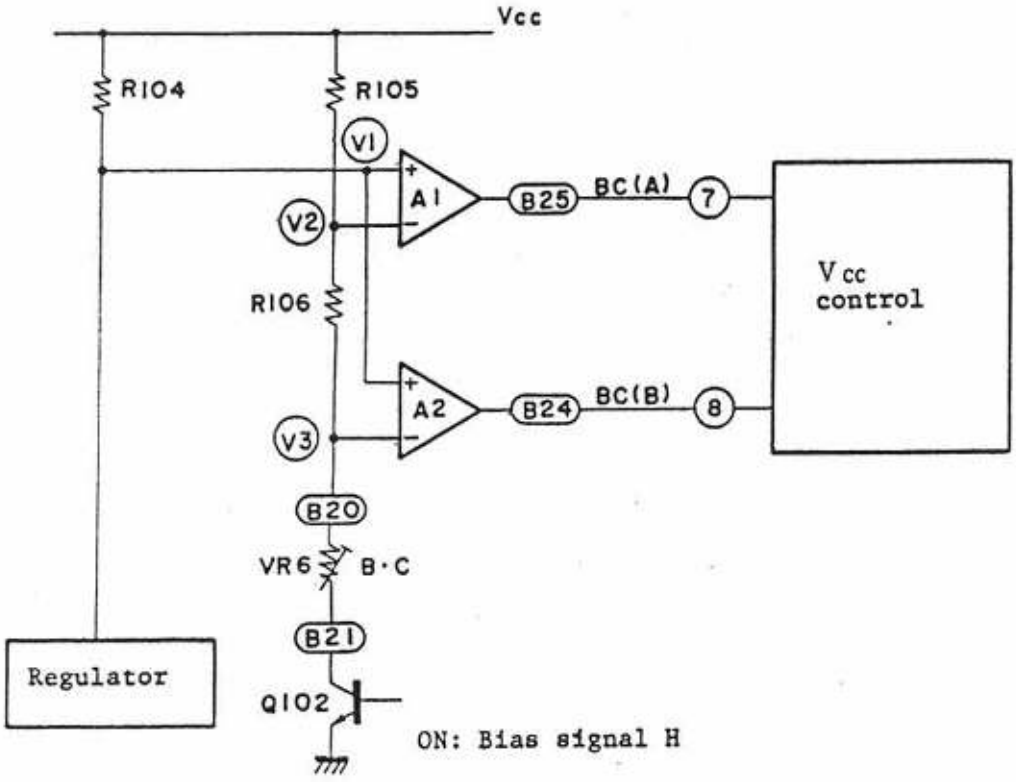
(4) Flash output control

The flash output control section holds the reference voltage to be compared with the input voltage from the integration section. When the speedlight fires, the input voltage of the integration section goes low to cross with the reference voltage. Then the output voltage of the flash output control section turns H to stop the output of the speedlight.

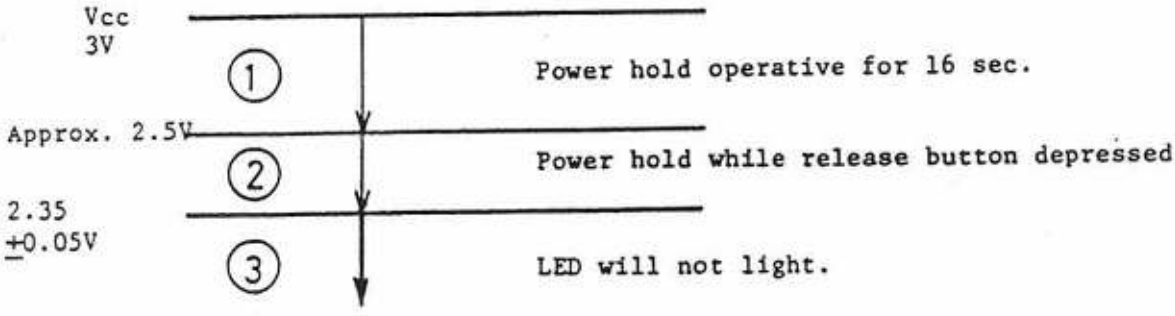
(5) ASA/ISO warning

If the film speed is set to ASA/ISO 800, the monitor, M.SW and ASA/ISO warning signals turn L and the diode D8 turns H. But the output of the diode D9 turns L to provide the stop signal. Then the ready-light LED blinks to warn the film speed set error.

8. Battery checker block

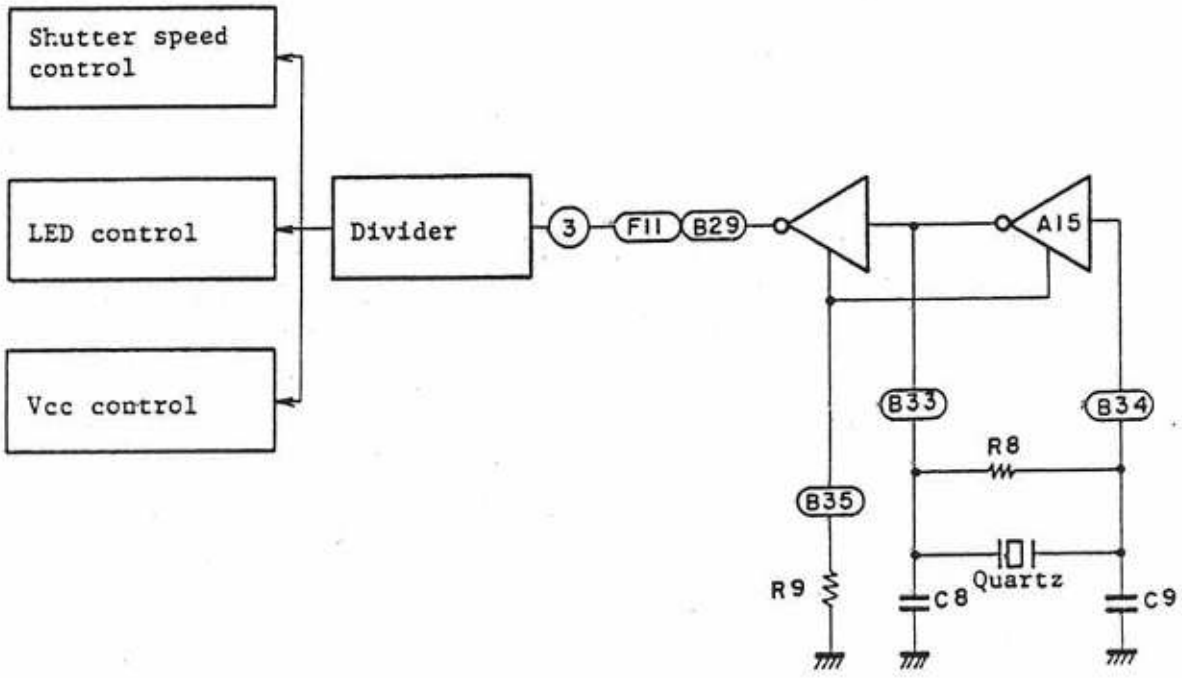


The battery power voltage VCC goes low and the voltage V1, V2 and V3 will go low accordingly. When V1 is equal to V2, the output of the amplifier A1 turns L. When V1 is equal to V3, the output of the amplifier A2 turns L.



VCC	V1, V2, V3	A1	A2
①	V1 > V2 > V3	H	H
②	V2 > V1 > V3	L	H
③	V2 > V3 > V1	L	L

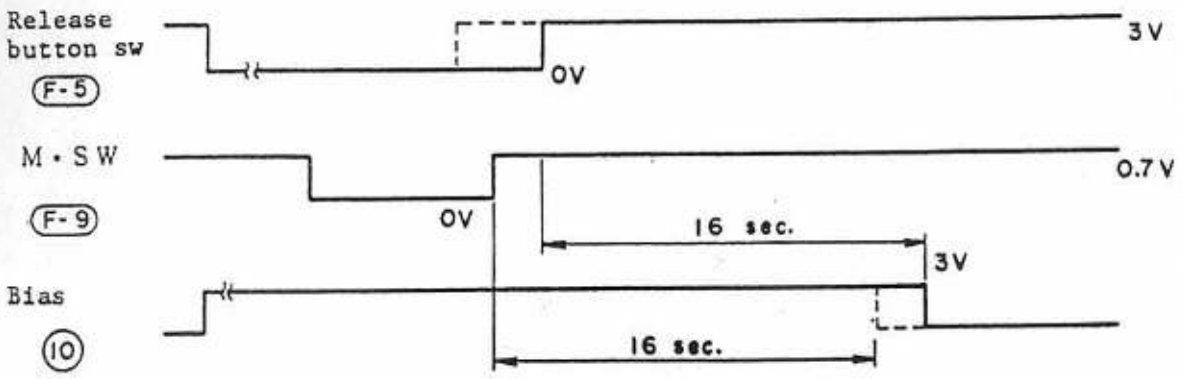
9. Oscillation block



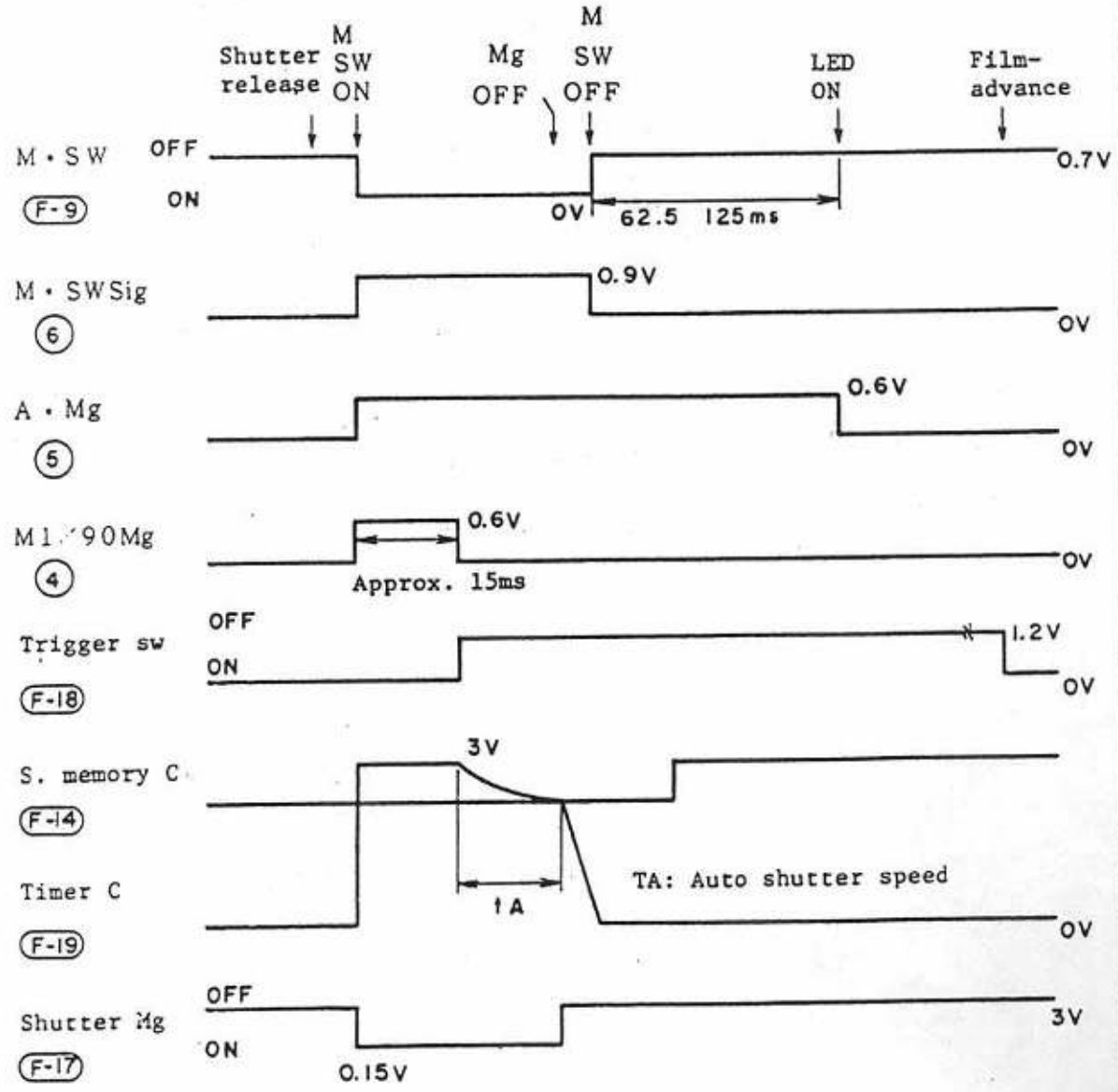
The oscillation block is in operation whenever batteries alive installed.
The substantially sinusoidal waveform of 32.768 KHZ can be observed at the check lands B33 and B34.
The same waveform will be observed at the check land B29 while power is held for 16 sec.

10. Timing chart

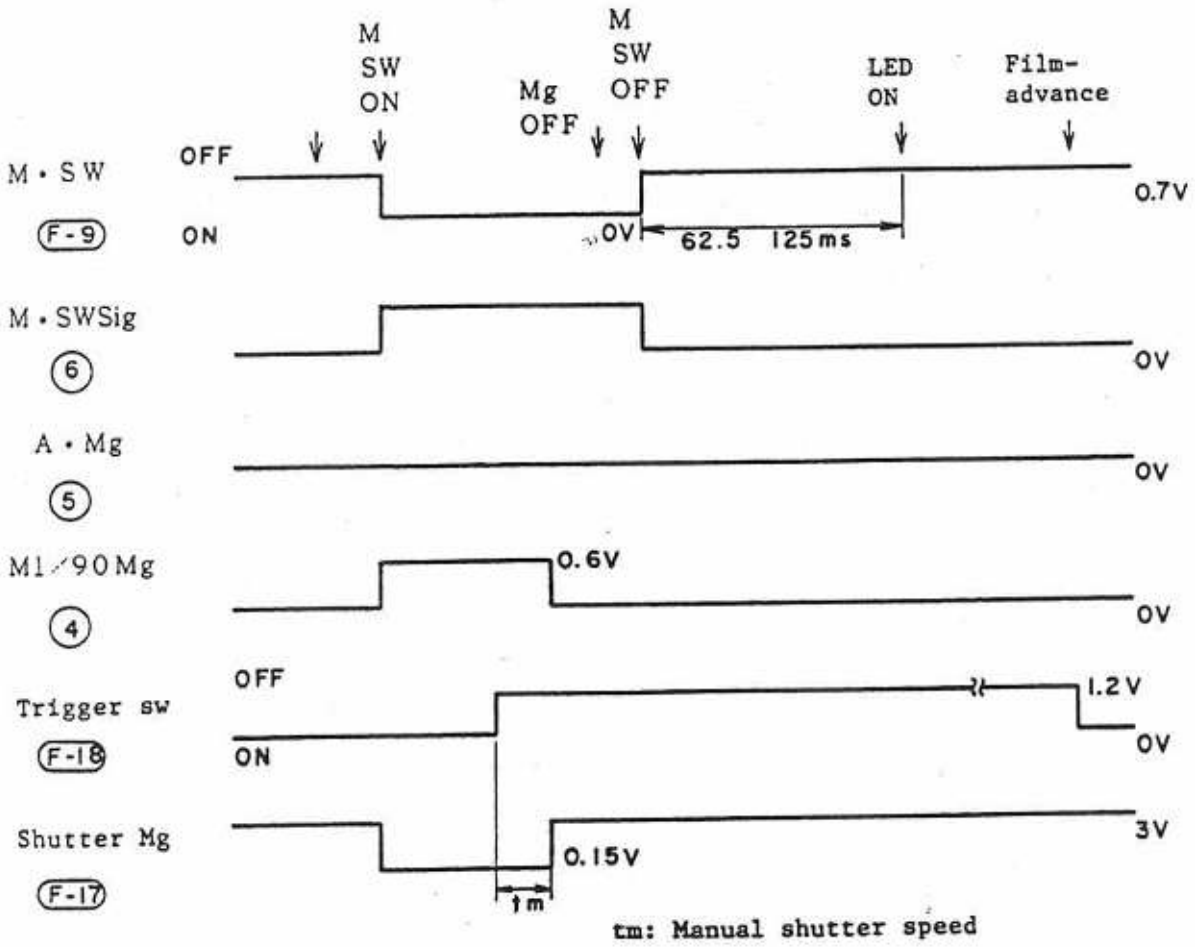
(1) Power hold



(2) Auto mode

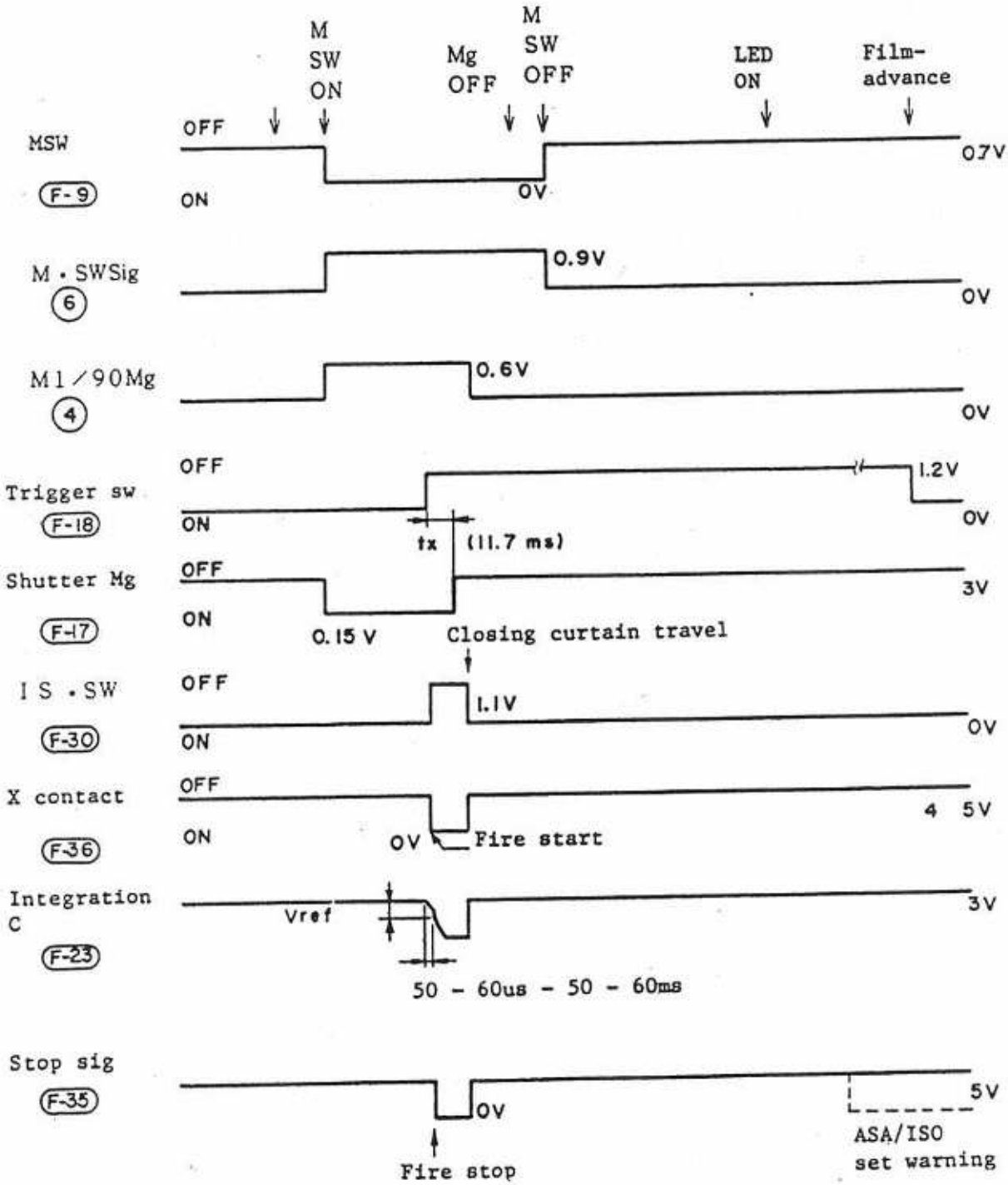


(3) Manual mode



tm: Manual shutter speed

(4) TTL mode


M SW ON
Mg OFF
M SW OFF
LED ON
Film-advance
MSW
F-9
OFF
ON
0.7V
0V
M・SWSig
6
0.9V
0V
M1/90Mg
4
0.6V
0V
Trigger sw
F-18
OFF
ON
1.2V
0V
tx (11.7 ms)
Shutter Mg
F-17
OFF
ON
3V
0.15 V
Closing curtain travel
IS・SW
F-30
OFF
ON
1.1V
0V
X contact
F-36
OFF
ON
4 5V
0V
Fire start
Integration C
F-23
Vref
3V
50 - 60us - 50 - 60ms
Stop sig
F-35
0V
5V
Fire stop
ASA/ISO set warning

11. Gray code table

Gray code		Check land	Shutter dial						
			A	1000	500	250	125	60	30
	X	F-8	1 Hi	1	1	0	0	0	0
	Y	F-7	1	0	0	0	0	1	1
	Z	F-6	0 Lo	0	1	1	0	0	1

0 = On
1 = OFF

(8) Troubleshooting

(1) Check conditions

35/2.5 lens or Tool lens J18085

ASA/ISO	100
Aperture	F5.6
Shutter	Auto mode
Frame counter	1 or more
Power	3V
Brightness	LV12

> The voltage and amperage should be checked while power is held for 16 sec., but the resistance should be checked while power is off.

(2) Check lands

F - (No.) ----- FPC B2001
A - (No.) ----- IC M51026 #1003
B - (No.) ----- IC M51027 #1004
○ ----- IC M51029 #1002
1 - (No.) ----- ASA/ISO circuit
2 - (No.) ----- LED panel circuit

(3) Test equipment

Digital multimeter J9003-3
Oscilloscope J9001-5
DC regulated power supply J9001-5
Tool battery J15238
Tool outerhousing J18165
Time counter J18142

(4) Abbreviations

FC. SW ----- Frame counter switch
M. SW ----- Memory switch
T. SW ----- Trigger switch
IS. SW ----- Integration switch
Mg ----- Magnet

IC reference voltages

1. Measuring reference: GND
2. Tolerance: ±10%
3. OV torelance: 50mv - 100mv
4. *(v): Time counter J18142 in operation

1. IC M51026P #1003

Pin No.	Voltage(v)	Check land	Note
A1	530m	F32	
A2	530m	F31	
A3	0 (50m)		
A4	240m	F28	
A5	240m	VR5(Down), VR3(Up)	
A6	650m	1-a	Variable by Auto level; ISO♪
A7	2.7	F29	Variable by Auto♪
A8	2.4 - 2.3	R15 Left	Variable by Auto♪
A9	0		
A10	2.8		
A11	0		
A12	0		
A13	1.5	1-e	
A14	* 1.5 (0.5)	F38	
A15	* 0 (5)	F35	
A16	3		
A17	* 1.1 (1.2)		Variable by TTL level
A18	* 0.7 (0.75)	F27	- ditto -
A19	0	F30	
A20	* 0 (3)	F23	
A21	3	F24	
A22	* 0 (240m)	F25	
A23	* 0 (240m)	F26	
A24	* 0 (240m)	F34	

2. IC M51027P #1004

Pin No.	Voltage(v)	Pin No.	Voltage(v)	Pin No.	Voltage(v)
B1	■ 0 → 1.5	B15	240m	B29	Clock pulse
B2	N.C	B16	N. C	B30	2.1
B3	0	B17	N. C	B31	Blank
B4	0	B18	0 (50m)	B32	△ 2.1
B5	Blank	B19	▲ 2.45	B33	0.6
B6	Blank	B20	2.3	B34	0.5
B7	Blank	B21	0	B35	2.5
B8	Blank	B22	2.8	B36	Blank
B9	Blank	B23	▲ 1.9	B37	0
B10	△ 2.35	B24	0.65	B38	Blank
B11	▲ 2.1	B25	0.65	B39	△ 2.6
B12	240m	B26	0	B40	△ 2.1
B13	Blank	B27	0	B41	3
B14	Blank	B28	0	B42	3

■ Before release → After release

▲ Variable by LED level, LED ƒ

3. IC M51029P #1002

Pin No.	Voltage(v)	Pin No.	Voltage(v)	Pin No.	Voltage(v)
1	N. C	15	● 0.6	29	
2	△ 2.1	16	● 0	30	
3	Clock pulse	17	● 0	31	
4	0	18	2.7	32	* 0 (1.5)
5	0	19	0.6	33	N. C
6	0	20	3	34	N. C
7	0.65	21	N. C	35	N. C
8	0.65	22	0 → 1.5(=B1)	36	N. C
9	▲ 1.9	23	50 - 60mv	37	0
10	△ 2.8	24		38	N. C
11	N. C	25	LED ON 1.1	39	1.1
12	N. C	26		40	0
13	N. C	27	LED OFF 1.8	41	0
14	● 0.6	28		42	* 0 (3)

▲ Variable by LED

● Gray code: Auto

IC pin nomenclature

1) IC M51026P #1003

Pin No.	Name	Pin No.	Name
1	SPD 1 (anode)	13	ISO warning
2	SPD 1 (cathode)	14	TTL monitor
3	Bias cutter	15	TTL stop
4	Regulated voltage	16	Vcc'
5	ISO ƒ	17	TTL shift input
6	VISO	18	TTL shift output
7	Auto ƒ	19	IS SW input
8	TVO	20	Int. condenser
9	Timer condenser	21	Latch release
10	Bias	22	Latch release
11	GND	23	SPD 2 (anode)
12	MSW sig	24	SPD 2 (cathode)

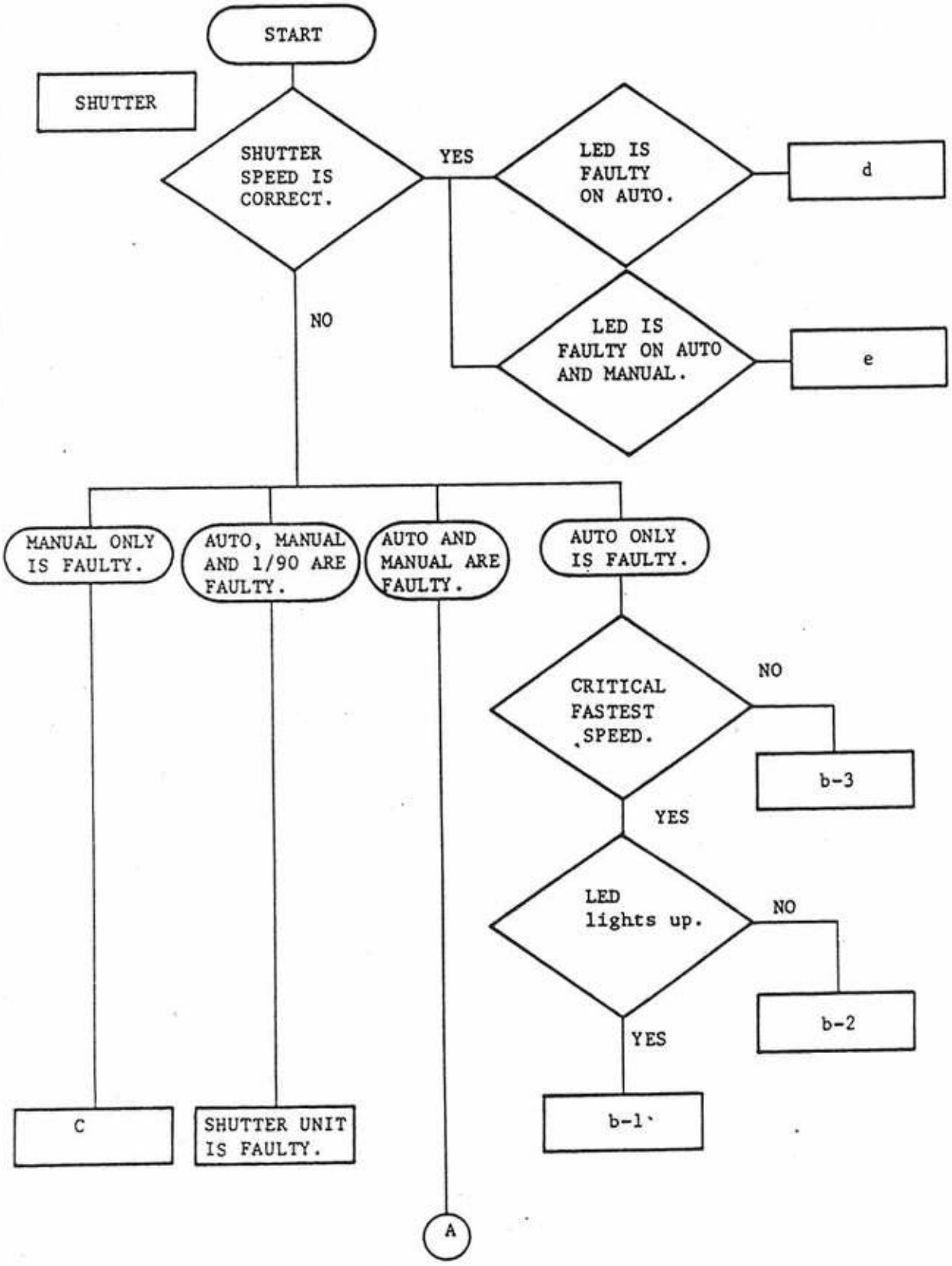
2) IC M51027P #1004

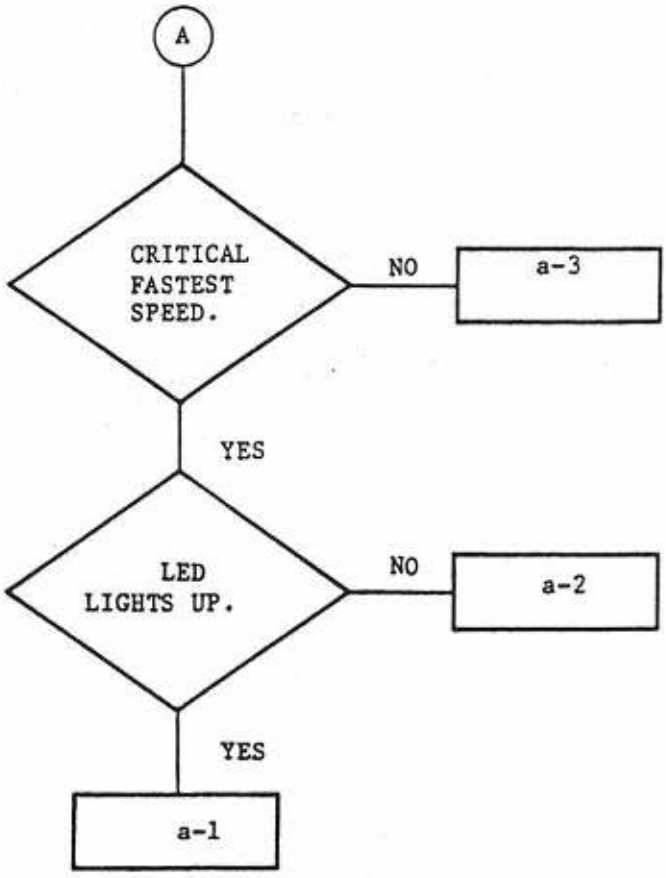
Pin No.	Name	Pin No.	Name
1	T. SW	22	Bias
2	NC	23	LED ƒ (2)
3	Timer condenser	24	BCA
4	Timer condenser	25	BCB
5	Blank	26	M.SW sig
6	Blank	27	A.Mg sig
7	Blank	28	M1/90 sig
8	Blank	29	C.P
9	Blank	30	LED output (1)
10	TVO	31	Blank
11	LED shift	32	LED output (2)
12	Regulated voltage	33	OSC (1)
13	Blank	34	OSC (2)
14	Blank	35	OSC (3)
15	T reference	36	Blank
16	NC	37	GND
17	NC	38	Blank
18	Bias cutter	39	Memory condenser
19	LED ƒ (1)	40	LED filter C
20	Battery check	41	Shutter Mg
21	Battery check	42	Vcc

3) IC M51029P #1002

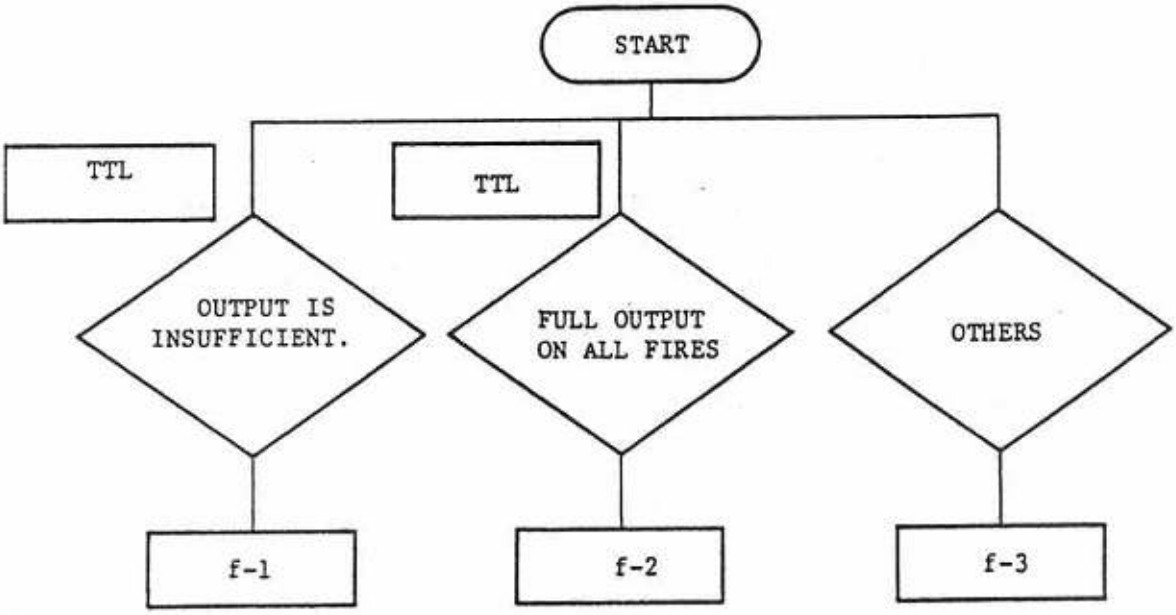
Pin No.	Name	Pin No.	Name
1	NC	22	Trigger
2	LED output	23	LED.R
3	C.P	24	▲ signal
4	M1/90 sig	25	1/1000 signal
5	A.Mg sig	26	1/500 signal
6	M.SW	27	1/250 signal
7	BCA	28	1/125 signal
8	BCB	29	1/60 signal
9	LED	30	1/30 signal
10	Bias	31	▼ signal
11	NC	32	Ready K signal
12	NC	33	NC
13	NC	34	NC
14	Gray code X	35	NC
15	Gray code Y	36	NC
16	NC	37	GND
17	Gray code Z	38	NC
18	Power hold	39	M.SW
19	Inj	40	NC
20	Vcc'	41	NC
21	NC	42	Ready A signal

A) SHUTTER OR LED IS FAULTY

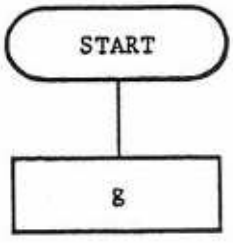



A
CRITICAL FASTEST SPEED.
NO
a-3
YES
LED LIGHTS UP.
NO
a-2
YES
a-1

B) TTL OUTPUT CONTROL IS FAULTY

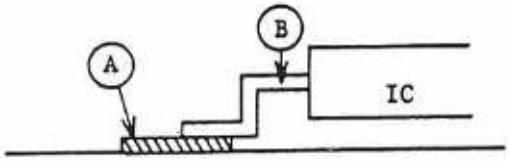


C) BATTERY DRAIN



Precautions

1) IC voltage check points

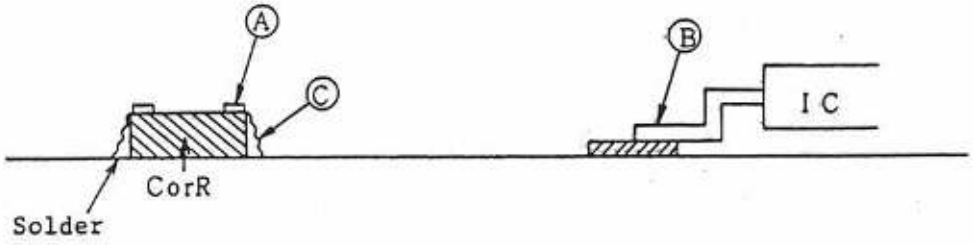


Output voltage: (A)

Input voltage : (A) and (B)

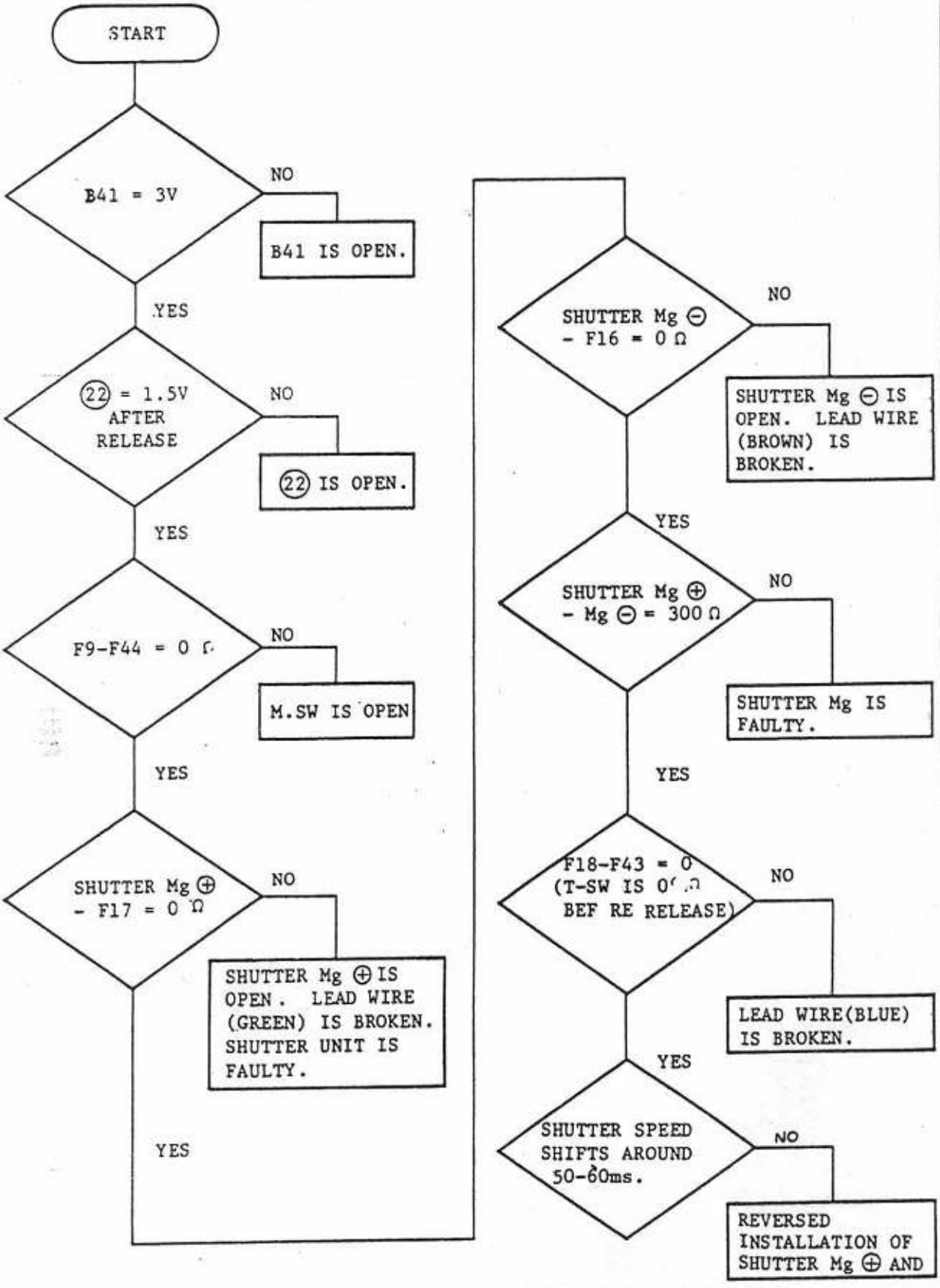
In case the voltage reading is not clear, measure the resistance.

2) Resistance check points

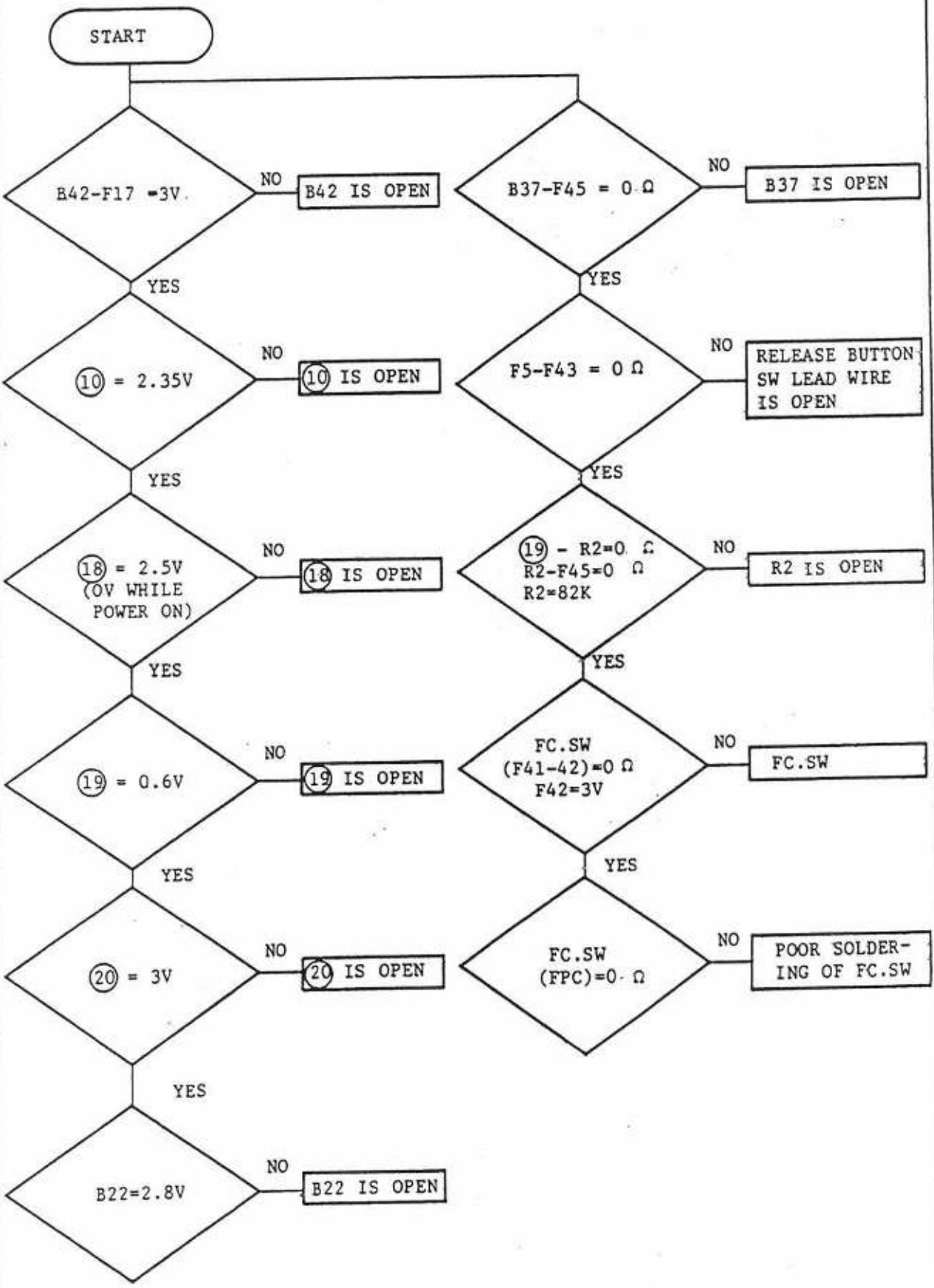


Avoid check on the point Ⓒ

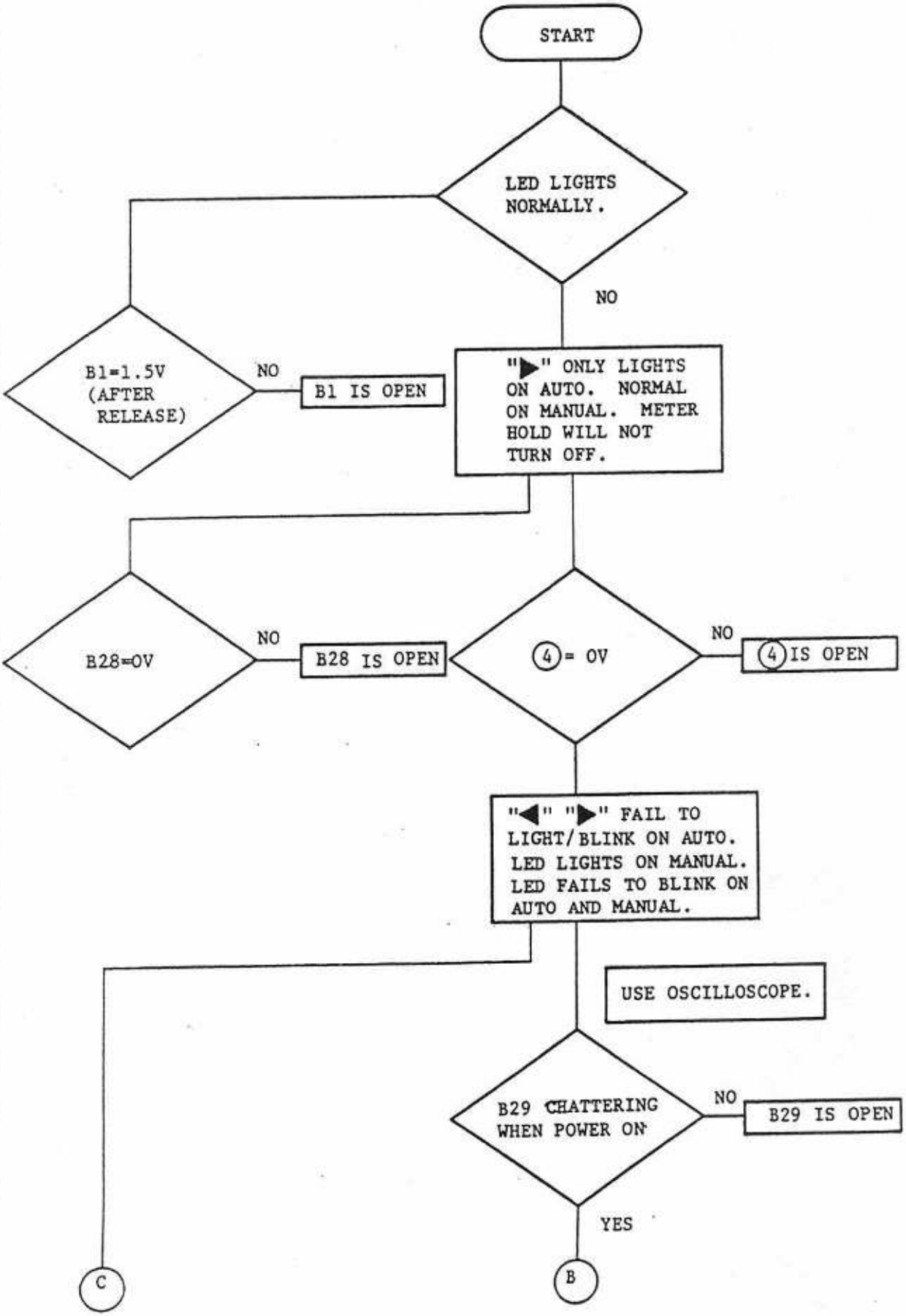
a-1 CRITICAL FASTEST SHUTTER SPEED ON AUTO AND MANUAL

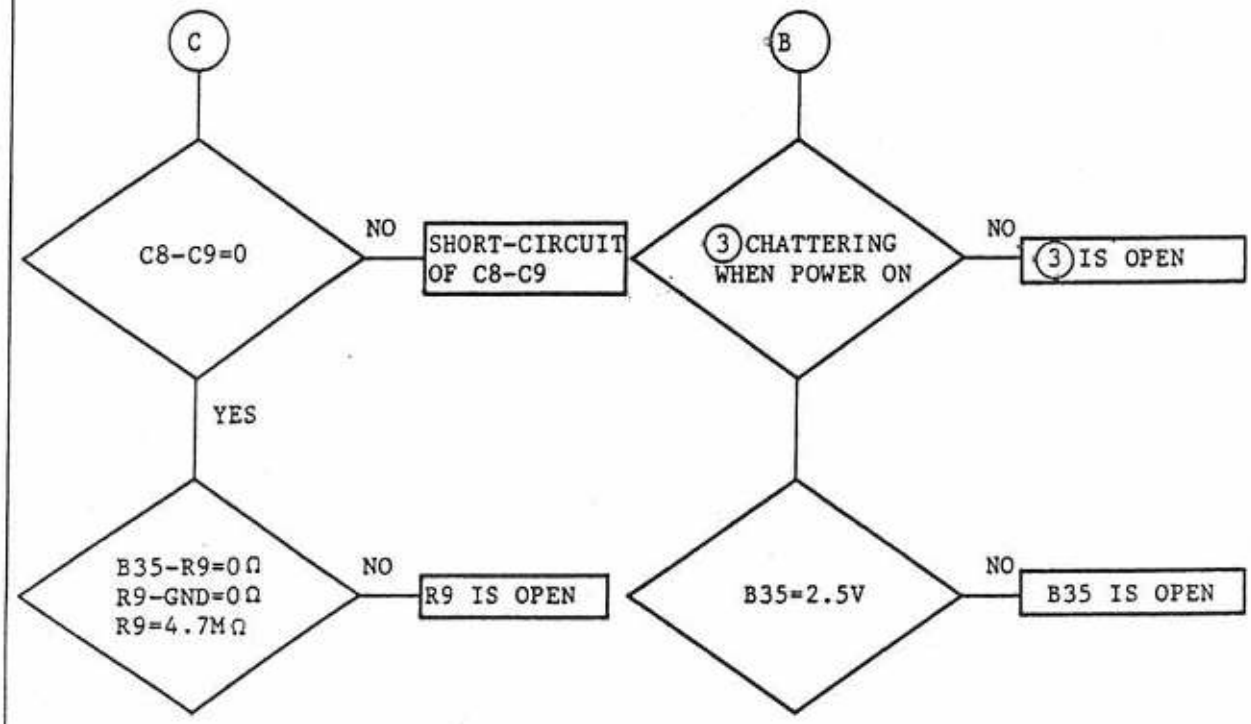


a-2 CRITICAL FASTEST SHUTTER SPEED ON AUTO AND MANUAL

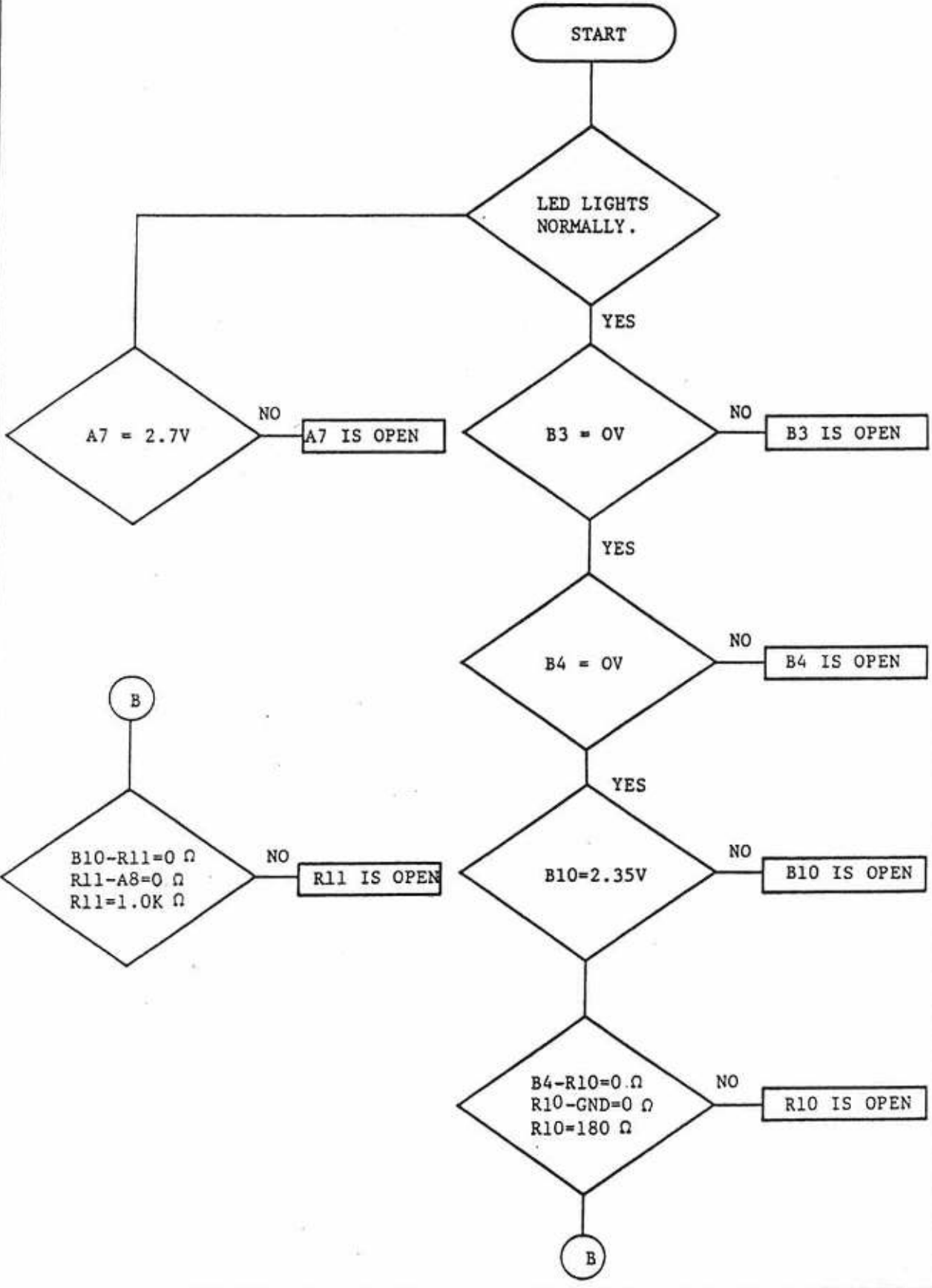


a-3 SHUTTER IS HELD OPEN ON AUTO AND MANUAL

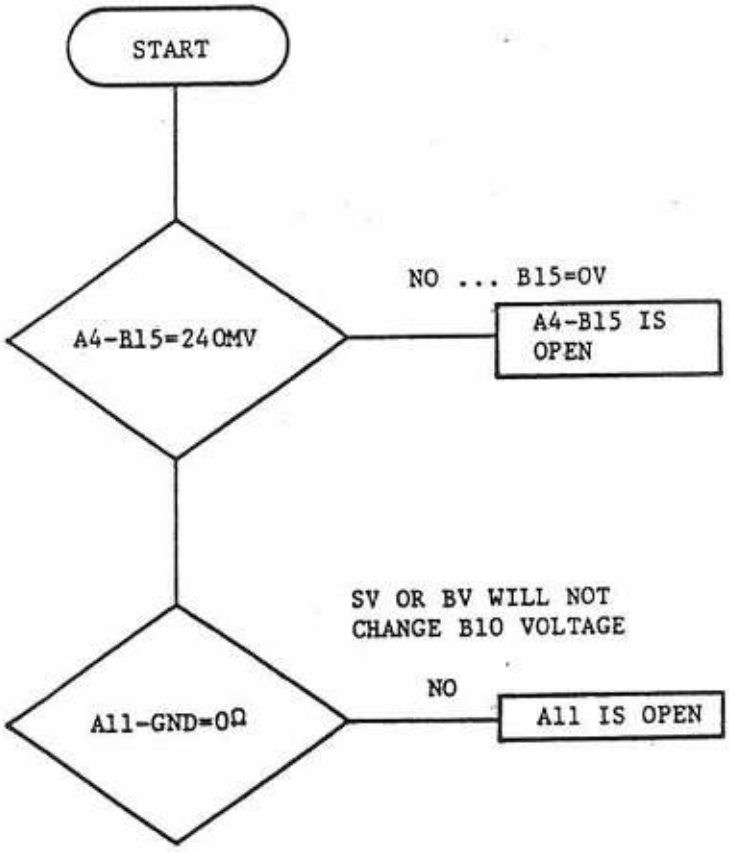



C
C8-C9=0
NO
SHORT-CIRCUIT OF C8-C9
YES
B35-R9=0Ω
R9-GND=0Ω
R9=4.7MΩ
NO
R9 IS OPEN
B
3 CHATTERING WHEN POWER ON
NO
3 IS OPEN
B35=2.5V
NO
B35 IS OPEN

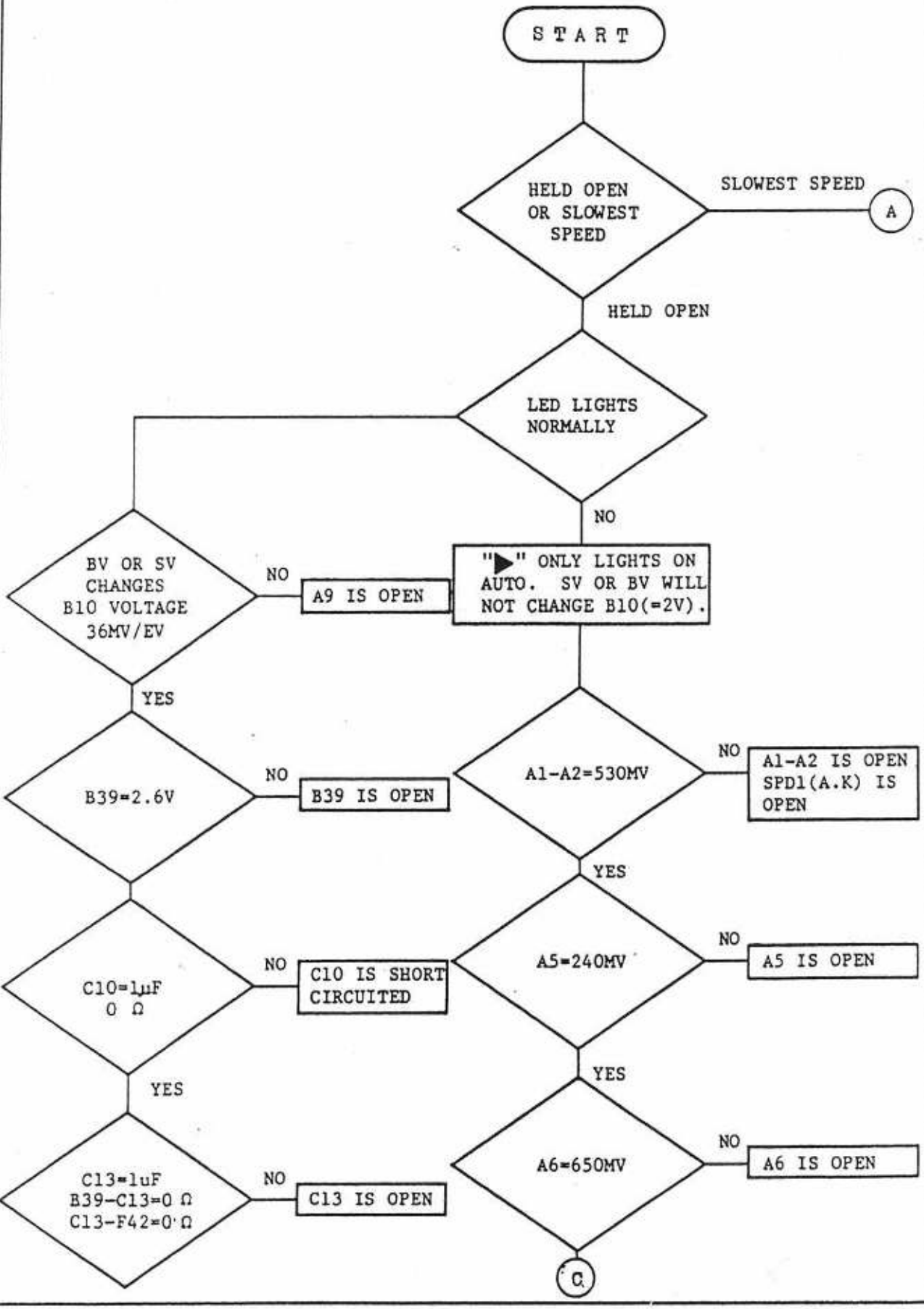
b-1 CRITICAL FASTEST SHUTTER SPEED

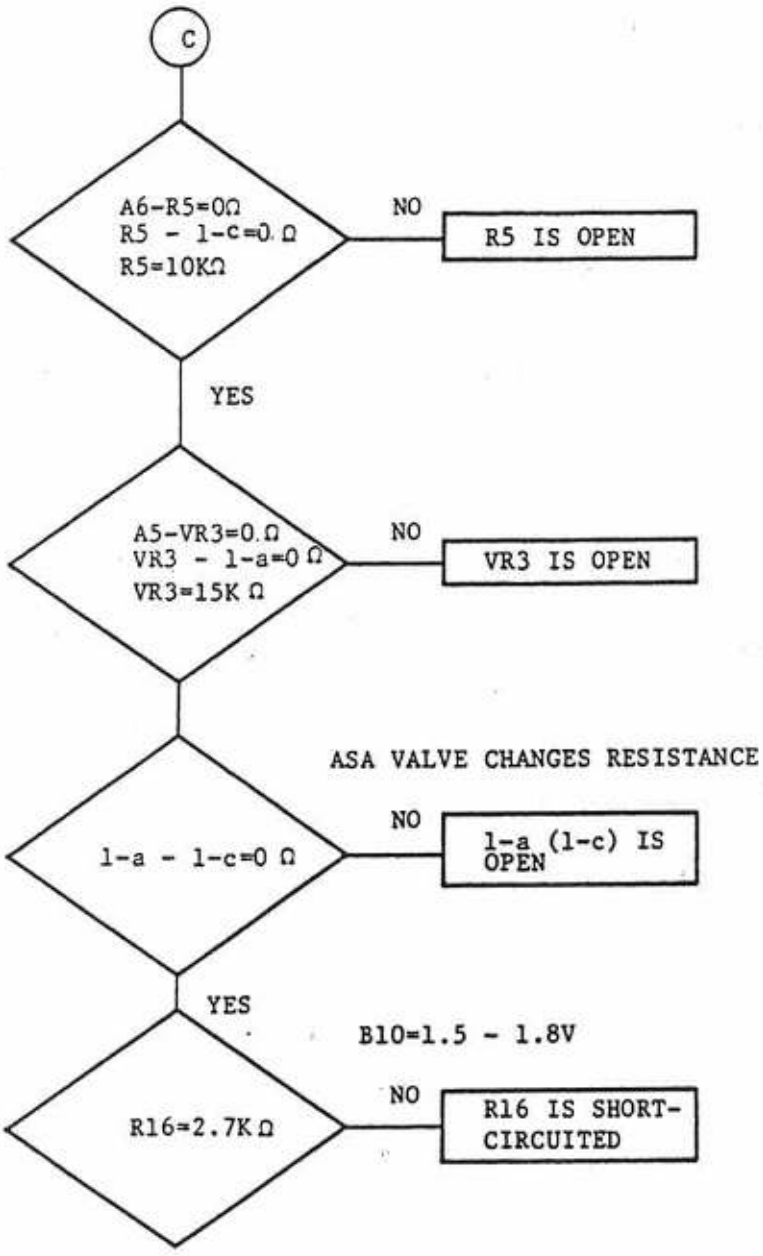


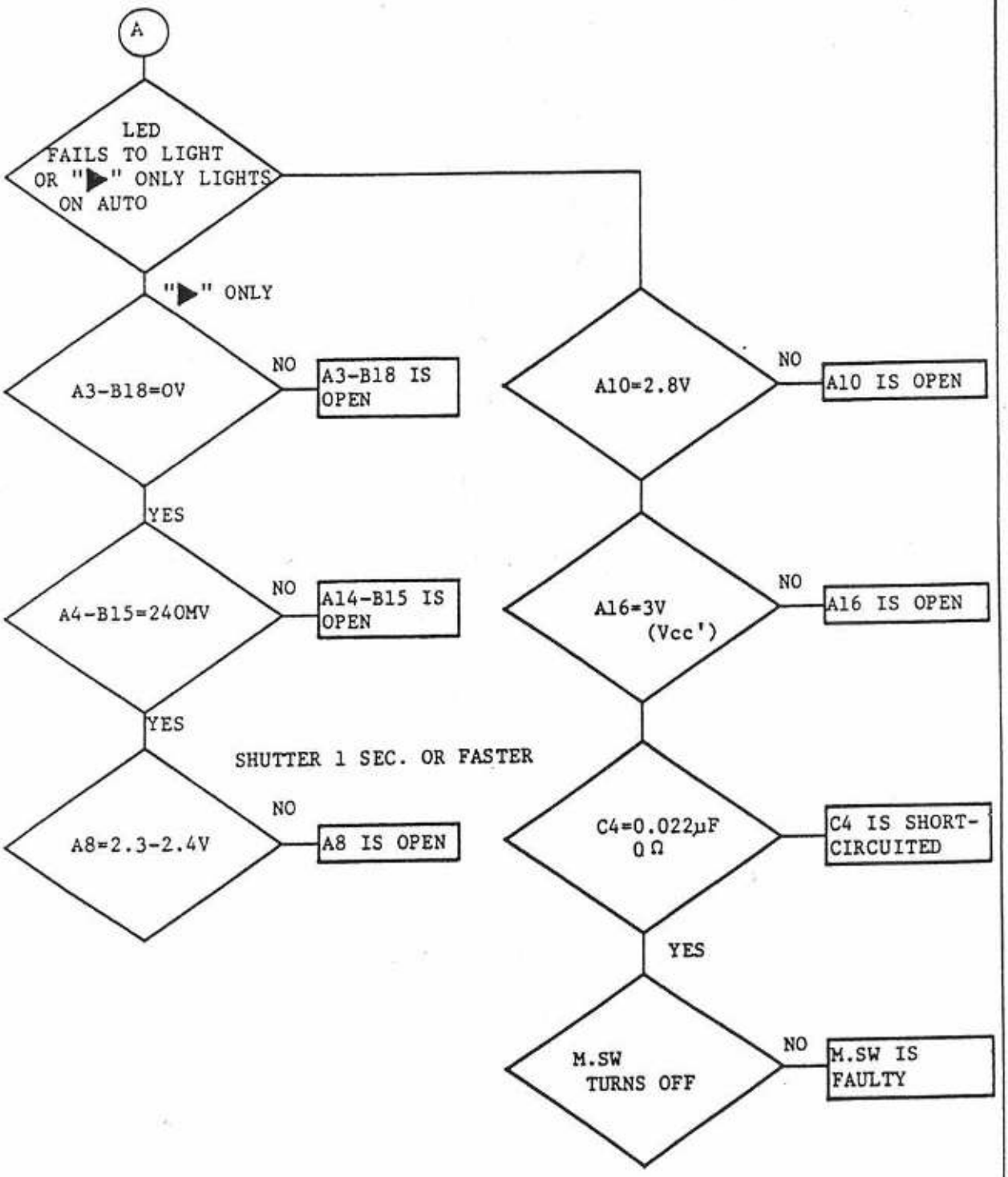
b-2 CRITICAL FASTEST SHUTTER SPEED ON AUTO



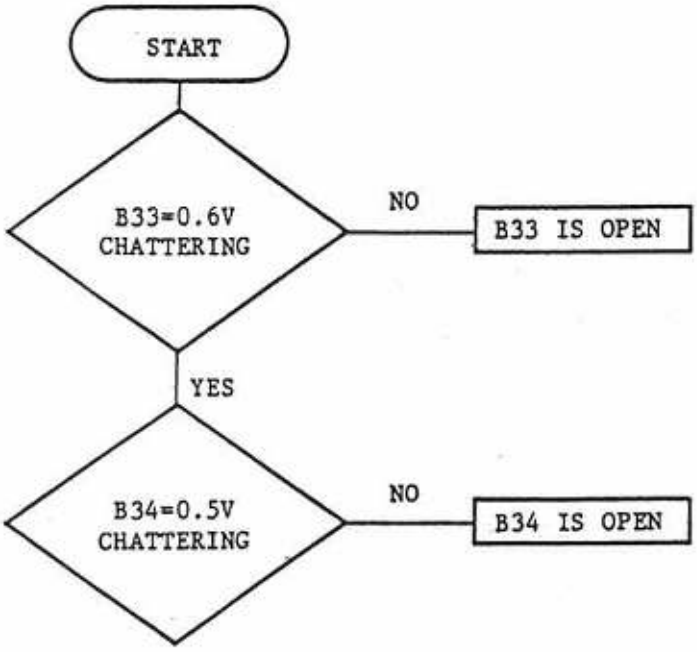
b-3 SHUTTER IS HELD OPEN OR SLOWEST SPEED ON AUTO




C
A6-R5=0Ω
R5 - 1-c=0 Ω
R5=10KΩ
NO
R5 IS OPEN
YES
A5-VR3=0 Ω
VR3 - 1-a=0 Ω
VR3=15K Ω
NO
VR3 IS OPEN
ASA VALVE CHANGES RESISTANCE
1-a - 1-c=0 Ω
NO
1-a (1-c) IS OPEN
YES
B10=1.5 - 1.8V
R16=2.7K Ω
NO
R16 IS SHORT-CIRCUITED


A
LED FAILS TO LIGHT OR "▶" ONLY LIGHTS ON AUTO
"▶" ONLY
A3-B18=0V
NO
A3-B18 IS OPEN
YES
A4-B15=240MV
NO
A14-B15 IS OPEN
YES
SHUTTER 1 SEC. OR FASTER
A8=2.3-2.4V
NO
A8 IS OPEN
A10=2.8V
NO
A10 IS OPEN
A16=3V (Vcc')
NO
A16 IS OPEN
C4=0.022μF 0Ω
C4 IS SHORT-CIRCUITED
YES
M.SW TURNS OFF
NO
M.SW IS FAULTY

C. INCORRECT SHUTTER SPEED

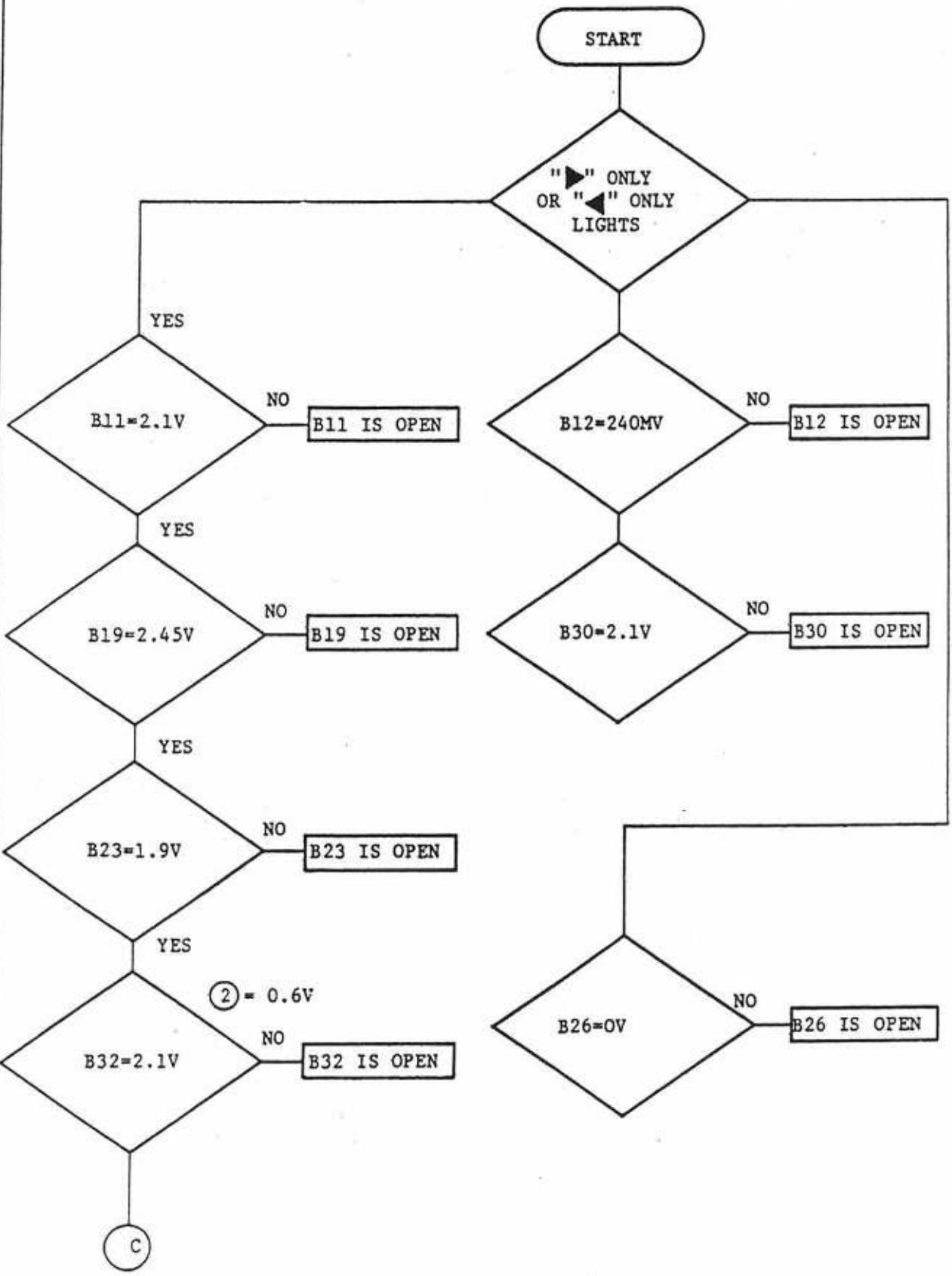


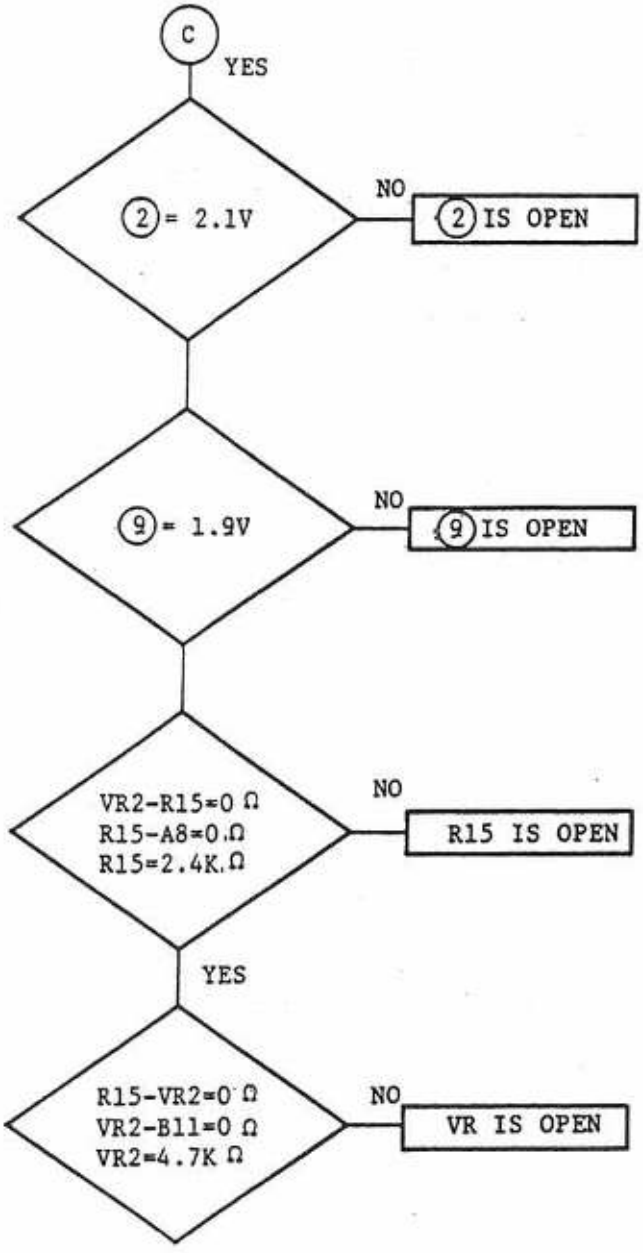
GRAY CODE

SPEED / FAULT	1/1000	1/500	1/250	1/125	1/60	1/30
(14) OPEN (X)			1/500	1/1000	A *	A
(15) OPEN (Y)	A	A *	1/30	1/60		
(17) OPEN (Z)	1/500			1/250	1/30	

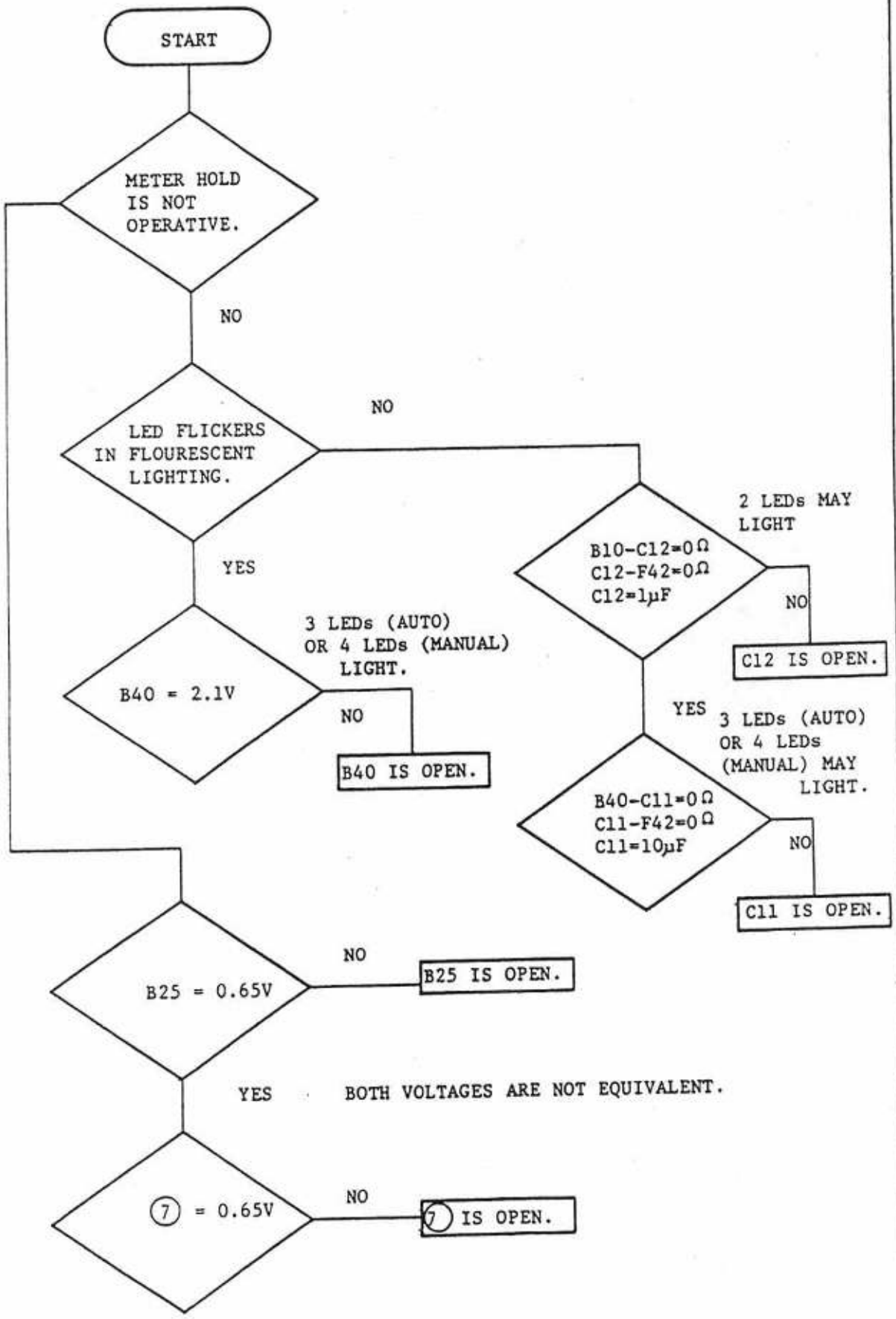
* --- VARIABLE

d. LED IS FAULTY ON AUTO

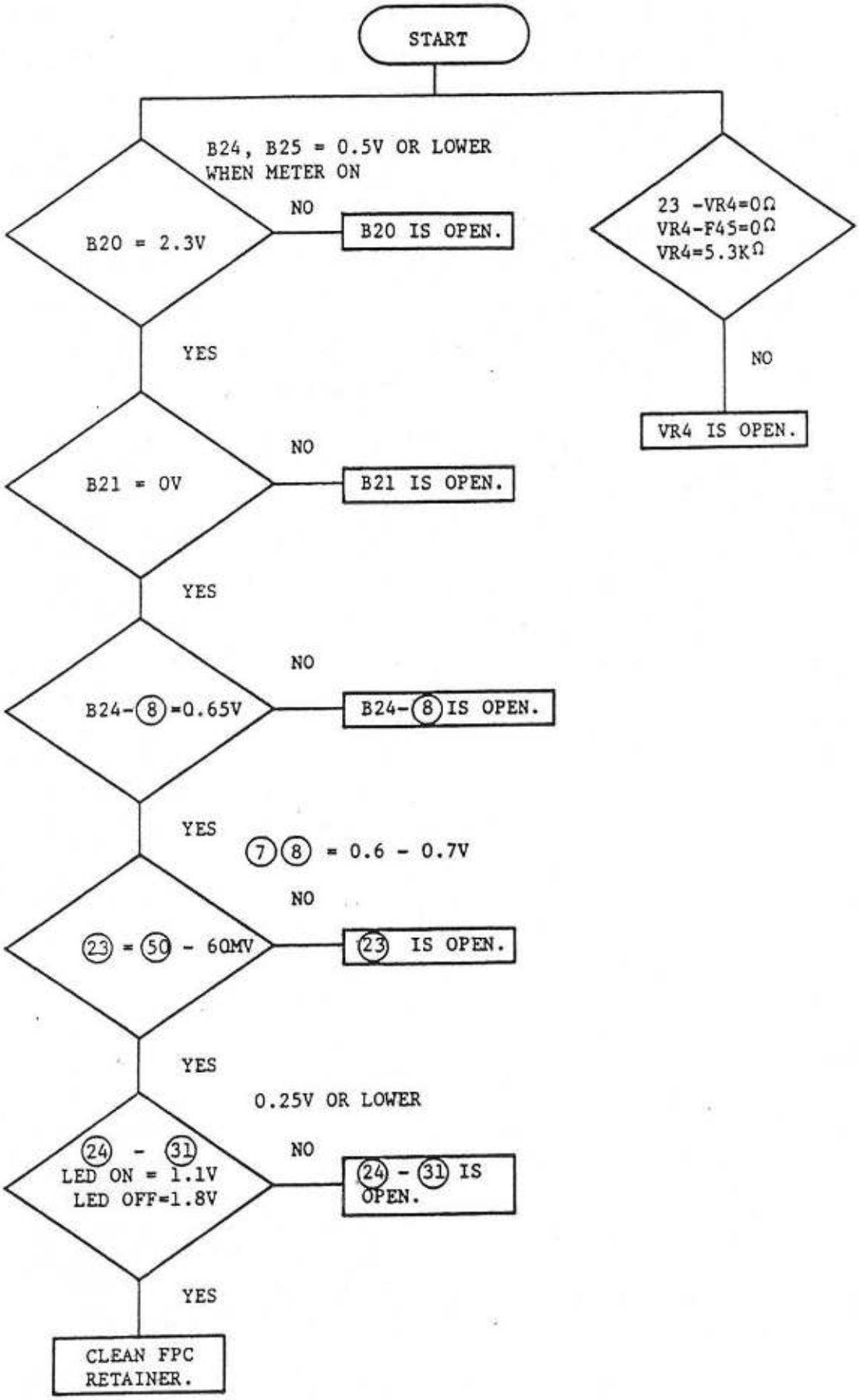



C
YES
② = 2.1V
NO
② IS OPEN
⑨ = 1.9V
NO
⑨ IS OPEN
VR2-R15=0 Ω
R15-A8=0 Ω
R15=2.4K Ω
NO
R15 IS OPEN
YES
R15-VR2=0 Ω
VR2-B11=0 Ω
VR2=4.7K Ω
NO
VR IS OPEN

e. LED IS FAULTY ON AUTO AND MANUAL

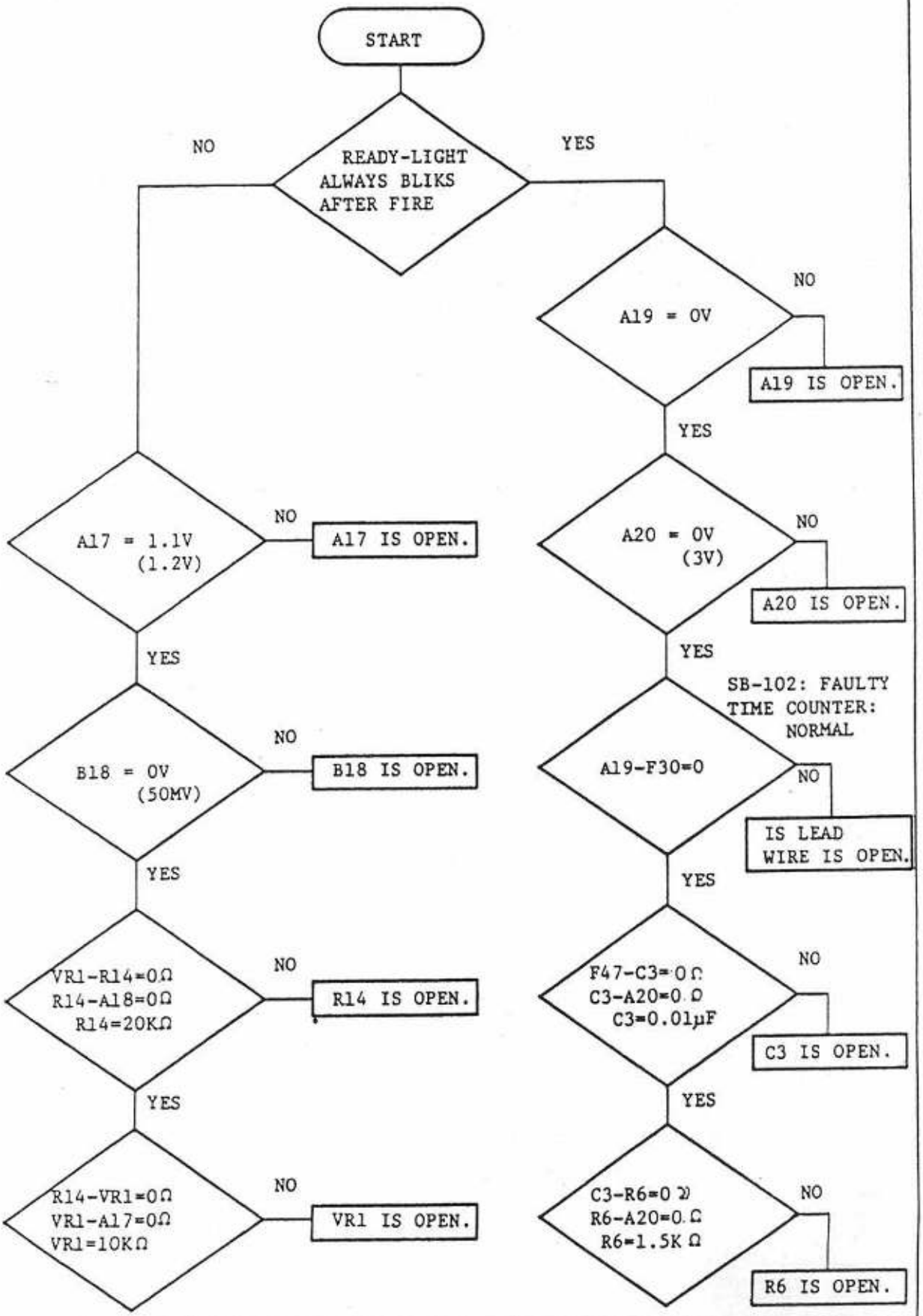


LED FAILS TO LIGHT ON AUTO AND MANUAL

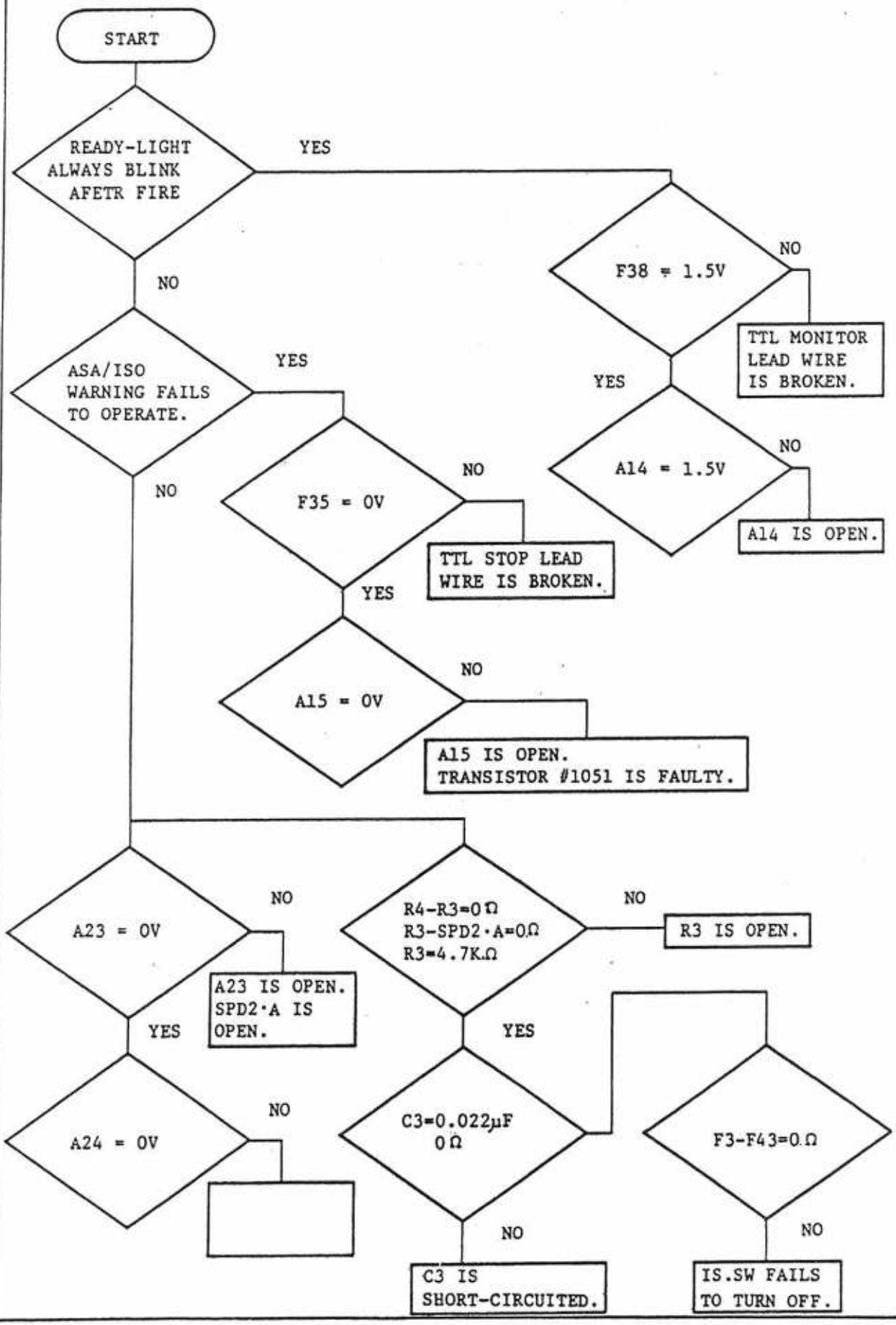


f-1. TTL OUTPUT CONTROL IS FAULTY.

( ) VOLTAGE WHEN TIME COUNTER IN OPERATION

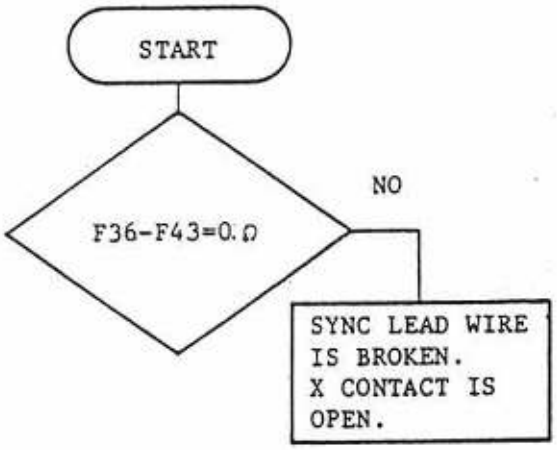


f-2. FULL OUTPUT ON ALL FIRES

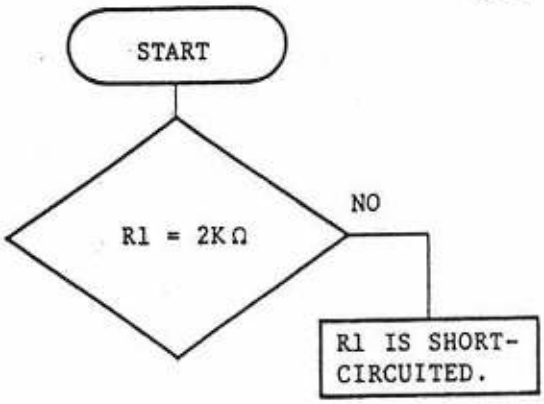


f-3. OTHERS

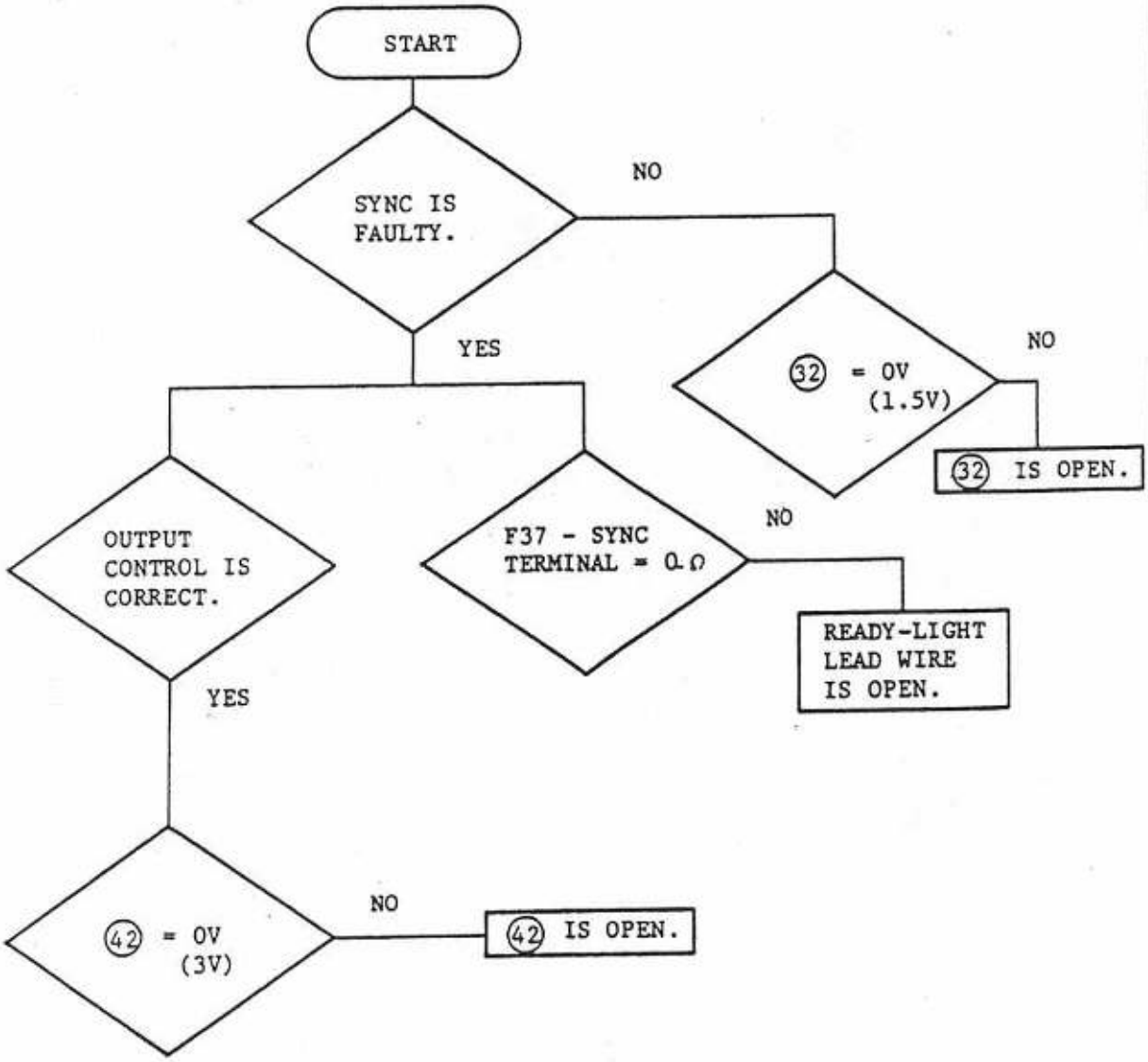
1) FAULTY FIRE



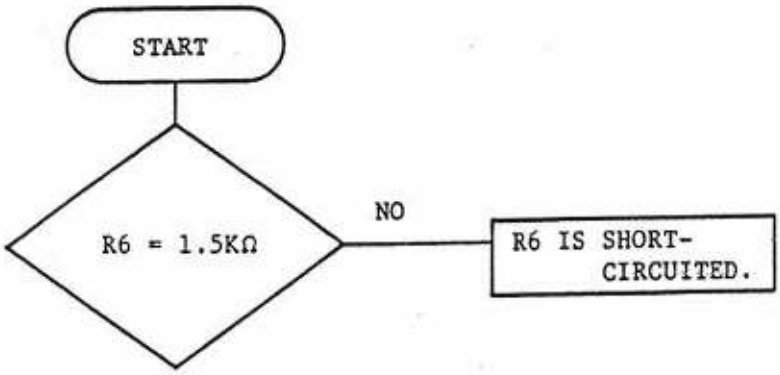
2) READY-LIGHT IS TOO BRIGHT WHEN FC.SW IS OFF.



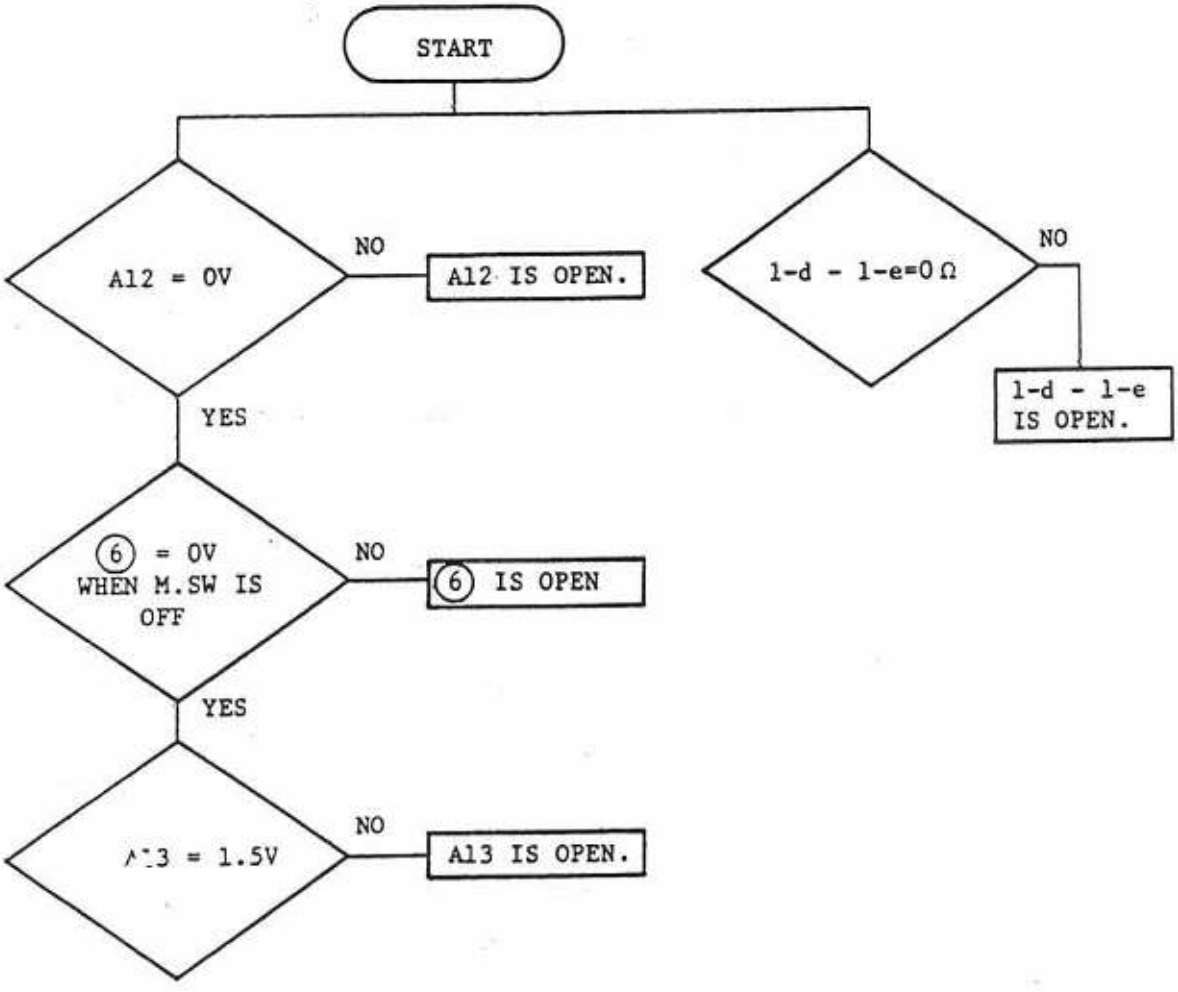
3) READY-LIGHT FAILS TO FIRE



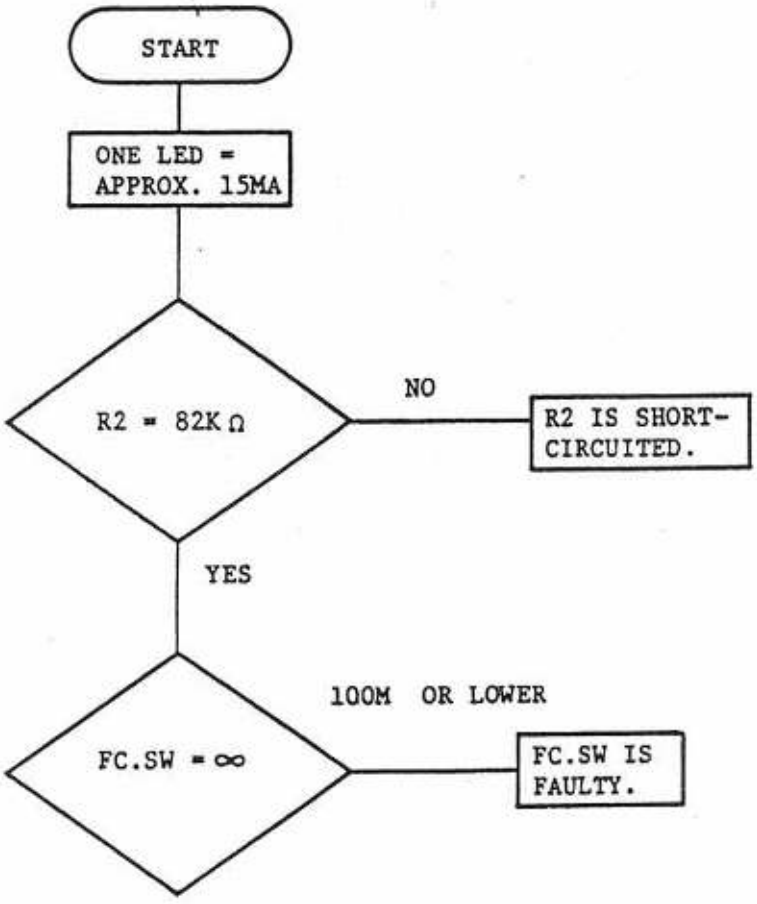
4) OVEREXPOSURE ON TTL CONTROL



5) ASA/ISO WARNING FAILS TO OPERATE



g. BATTERY DRAIN



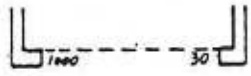
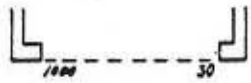
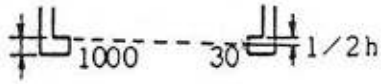
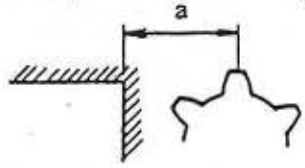
INSPECTION STANDARDS FOR REPAIR & TOOLS

Contents

Page

[1] INSPECTION STANDARDS FOR REPAIR R1

[2] TOOLS R5

	Item	Standard	Tool
Viewfinder/LED panel	Viewframe coverage.	85±3% (∞)	J18166 J15205 J18033 Standard lens
	Parallax error	0.8mm or less vertically and horizontally on film frame	
	Inclination	Within 1.5°	
	Diopter	-0.9±0.5 dpt.	Diopter scope
	Magnification	0.55±0.05X	
	LED panel	Position: Tops of LED figures should be aligned the bottom of viewfinder frame.  High limit  Low limit Inclination: Within the half of frame's width  Visible: At the eyepoint of 40mm	J15205
Shutter release/film advance	Winding angle	144° (Stand-off position: 30°)	
	Winding torque	Film unloaded: 3kg/cm or less Film loaded: 4kg/cm or less	Torque meter
	Shutter release button	Release power: 450 - 1200g	J5029
		Release stroke Power switch ON: 0.8±0.2mm Shutter release: 1.8±0.3mm After release: 0.5mm or more	J19004
	Rewinding torque	Film loaded: 1.5kg/cm or less	Torque meter
	Sprocket	Sprocket teeth position: $27.7^{+0.8}_{-0.4}$mm(a) 	J18064-1
		Sprocket play: 0.8mm or less (winding limit)	
		Frame-to-frame space: 2±1mm	Slide calliper

	Item	Standard	Tool
	Spool	Torque: 90 - 140g/cm Slipping load: 144 - 267g	J15003 J5019
	Aperture	Picture size: $24^{+0.8}_{-0}$ x $36^{+0.8}_{-0}$ mm	Slide calliper
Flange local distance	Flange focal distance	Flange focal distance: 27.02±0.03mm Parallel: 0.04mm or less Height difference between film guide rails: 0.23±0.02mm	J18086 J19004
Power	Power duration	16±2 sec. after finger is taken off release button	Stopwatch
	Battery check	Power hold: 2.56V LED off: 2.29V	J9001-5 J9003-3 J15238
	Power	LED panel: 8.4mA or less (one LED lighting) 11.8mA or less (two LEDs lighting) Shutter release: 15.2mA or less TTL flash control: 9.5mA or less	J9001-5 J9004 J15238
	Power drain	4.2μA or less	J9003-1
Manual shutter	Exposure time	(see table below)	J19036
	Variation	1/1000 sec.: 0.45EV or less 1/500 - 1/30 sec.: 0.3EV or less	
	Shutter curtain travel speed	6.5 - 7ms	
Synchronization	Time-lag	0.3 - 1.2ms (M90 or sync speeds) 1.5ms or more after sync-on	J19008-2
	Contact efficiency	50% or more	J19028-1
	Insulation resistance	30MΩ or more (DC500V)	

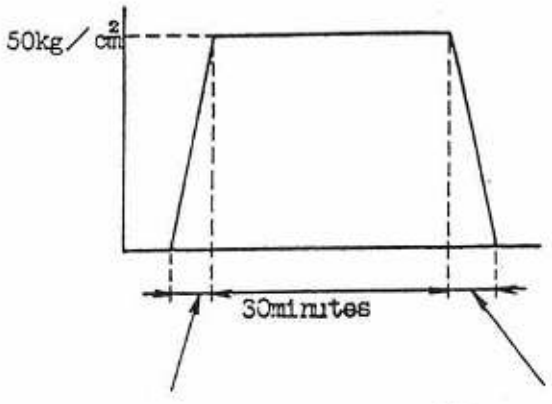
Shutter dial	Standard(ms)	Tolerance(ms)
1000	0.98	0.69 - 1.39 (±0.5EV)
500	1.95	1.58 - 2.40 (±0.3EV)
250	3.91	3.18 - 4.81 (±0.3EV)
125	7.81	6.34 - 9.62 (±0.3EV)
60	15.63	12.7 - 19.2 (±0.3EV)
30	31.25	25.4 - 38.5 (±0.3EV)
M(90)	11.1	9.0 - 14.0($^{+0.33}_{-0.3}$EV)
High limit	0.67	0.33 - 1.33 (±1EV)

Auto shutter

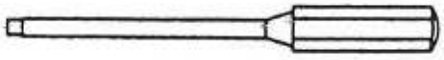
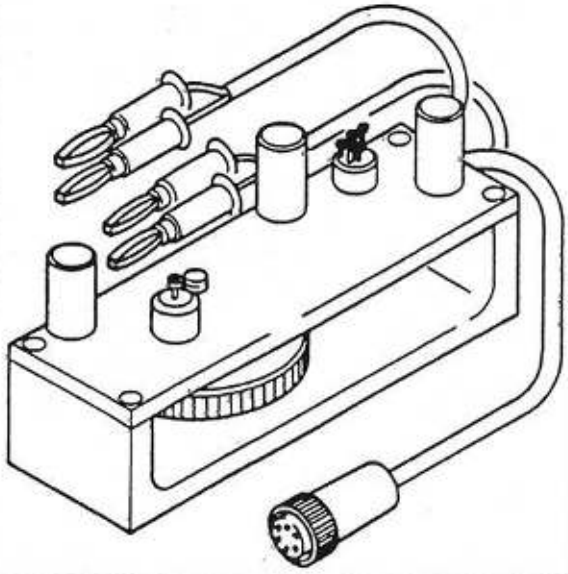
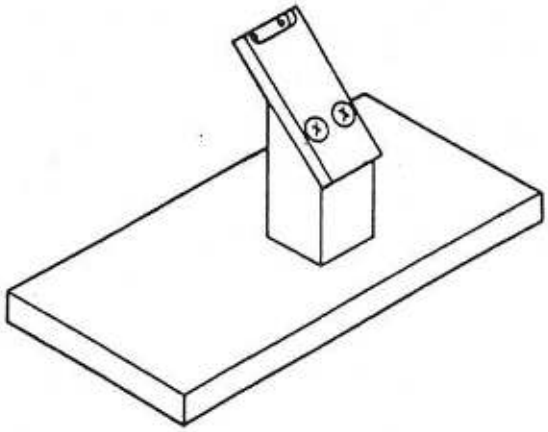
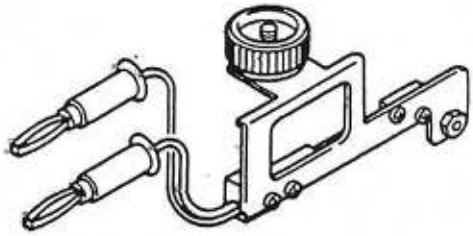
Item	Standard					Tool
Exposure time	LV	ISO	Dial	Standard (ms)	Tolerance(ms)	Tool lens (35mm F5.6) J18085 J19036 J15238 J18084 J18142
	9	1600	1/250	3.91	2.76 - 5.52	
	9	800	1/125	7.81	5.52 - 11.0	
	9	100	1/15	62.5	44.2 - 88.4	
	12	800	1/1000	0.98	0.64 - 1.48	
	12	100	1/125	7.81	5.52 - 11.0	
	12	25	1/30	31.3	22.1 - 44.2	
	15	100	1/1000	0.98	0.64 - 1.48	
	15	25	1/250	3.91	2.76 - 5.52	
	1/1000 sec.: ±0.6 EV 1/500 - 1/30 sec.: ±0.5 EV					
Speed difference between two adjacent settings	1/1000 - 1/250 sec.: 1±0.65EV 1/125 - 1/30 sec.: 1±0.45EV					
Variation	1/1000 sec.: 0.45EV or less 1/500 - 1/30 sec.: 0.3EV or less					
Sync speed (1/90 sec.)	Exposure time: 9 - 15.6ms Variation: 0.3EV or less					

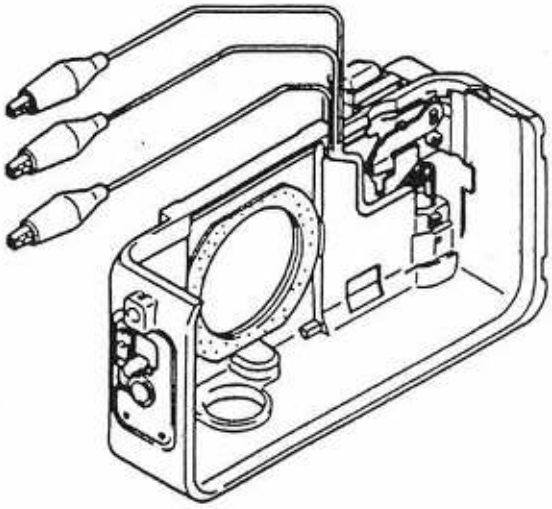
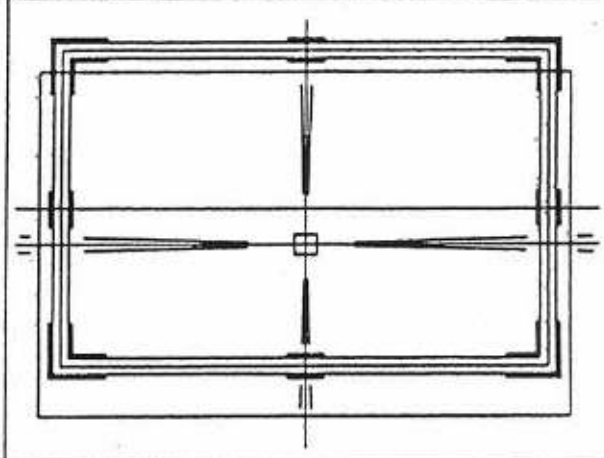
Exposure metering on auto

Item	Standard								Tool
LED display accurancy	Tolerance: ±0.5EV								Tool lens (35mm F5.6) J19036 J18085
	Dial	LV	ISO	LED display					
	1/1000	15	100	▲			○	○	
				1000	○	○	○		
				500		○			
	1/125	12	100	250			○		
				125	○	○	○		
				60		○	○		
	1/30	12	25	30	○	○	○		
				▼		○		○	
Out of metering range warning	LV10 $^{+0.75}_{-0.75}$: LED ▶ blinking LV15 $^{+0.75}_{-0.25}$: LED ◀ blinking								

<table>
<tr><th></th><th>Item</th><th>Standard</th><th>Tool</th></tr>
<tr><td></td><td>Ready-light ϟ</td><td>Ready-light should turn on when the flash unit is fully charged
<table>
<tr><td colspan="2">Frame counter SW</td><td colspan="2">ON</td><td colspan="2">OFF</td></tr>
<tr><td colspan="2">Power SW</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td></tr>
<tr><td rowspan="2">M90, B</td><td>TTL</td><td>BLINK</td><td>BLINK</td><td>BLINK</td><td>BLINK</td></tr>
<tr><td>Non-TTL</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td></tr>
<tr><td>Manual
———
Auto</td><td>TTL, Non-TTL</td><td>ON</td><td>ON</td><td>ON</td><td>OFF</td></tr>
</table></td><td>Flash unit</td></tr>
<tr><td></td><td>Automatic Sync speed set</td><td>Auto: A 1/90 sec.
Manual 1/1000 - 1/125 sec.: A 1/90 sec.
Manual 1/60 - 1/30 sec.: Same
(Frame counter SW: ON, Power SW: ON, Flash unit's power: ON)</td><td></td></tr>
<tr><td></td><td>LED display</td><td>Auto: Normal operation
Manual: Normal operation
M90, B: Off</td><td></td></tr>
<tr><td></td><td>EV tolerance on TTL control</td><td>±1EV</td><td></td></tr>
<tr><td></td><td>Flash stop signal time</td><td>765 - 879μs</td><td>J19036
J18142
J15238
J15240</td></tr>
<tr><td></td><td>ASA/ISO set error warning on TTL control</td><td>ASA/ISO 400 or less: Ready-light ON
ASA/ISO 800 or more: Ready-light BLINK</td><td></td></tr>
<tr><td></td><td>Waterproof</td><td>50kg/cm^2 in 30 minutes
 
</td><td>J18026</td></tr>
</table>

(1) NIKONOS-V用工具ゲージ一覧表　　Tool List

工具番号 Tool No.	名称 Name	略図 Illustration	区分 Class	備考 Remarks
J5135	調整用ドライバー Screwdriver		A	FG-20 ㊀
J15238	回路点検電池工具 Tool battery		A	
J15239	FS 圧接部組込工具 FPC assembling stand		A	
J15240	タイムカウンター IS接続コネクタ IS connector		A	

工具番号 Tool No.	名称 Name	略図 Illustration	区分 Class	備考 Remarks
J15241	水漏れチニック工具 Cap for water proof test		A	
J18165	工具用外箱 Tool outer housing		A	
J18166	画角出し用標板 Plate for parallax check		C	

PARTS LIST

Contents Page

[1] PARTS NUMBER REFERENCE TABLE 1

[2] PARTS LIST 4

[3] ASSEMBLY LIST 18

部品対照表 Parts Number Reference Table

補助番号 Auxiliary Number	部品番号 Part Number
G1	1G226-002
G2	1G234-001
G3	1G133-002
G4	1G133-003
G5	1G580-002
G9	1G122-002
13	1K610-519
14	1K087-124
15	1K081-003
16	1K646-004
17	1K646-005
18	1K646-006
19	1K600-306
19	1K600-307
19	1K600-308
19	1K600-309
20	1K646-007
21	1K160-405
23	1K640-442
24	1K100-035
25	1K080-005
28	1K680-401
29	1K050-035
29	1K050-031
29	1K050-029
29	1K050-048
30	1K467-058
34	1K607-002
35	1K400-078
38	1K640-426
53	1K120-175
56	1K206-028
57	1K680-382
58	1K206-029
59	1K165-065
60	1K110-152
60	1K110-178

補助番号 Auxiliary Number	部品番号 Part Number
61	1K110-153
61	1K110-179
63	1K115-793
64	1K115-794
68	1K115-796
69	1K115-797
72	1K610-257-1
73	1K110-090
74	1K115-233
77	1K600-148
83	1K206-030
84	1K360-020
92	1K230-128
93	1K680-383
101	1K600-311
202	1K610-527
203	1K362-040
205	1K600-327
208	1K160-416
209	1K130-202
210	1K110-163
211	1K208-043
212	1K480-018
216	1K310-053
217	1K240-317
219	1K110-164
219	1K110-180
220	1K680-393
221	1K240-318
222	1K115-807
223	1K165-066
225	1K600-328～329
305	1K230-129
310	1K230-133
311	1K130-206
314	1K230-130
315	1K314-197

補助番号 Auxiliary Number	部品番号 Part Number
316	1K120-176
320	1K230-131
321	1K115-799
327	1K115-800
328	1K115-801
401	1K300-052
405	1K340-082
407	1K314-204
408	1K130-088-2
409	1K130-089
412	1K130-090
413	1K123-044
416	1K340-080
418	1K600-313
419	1K220-143
421	1K160-406
422	1K630-105
423	1K120-077
424	1K370-661
427	1K146-022-1
428	1K225-086
433	1K130-200
437	1K610-523
438	1K130-203
443	1K208-044
464	1K233-038
466	1K260-143-1
472	1K480-016
475	1K230-136
477	1K260-147
478	1K120-078
495	1K260-144
498	1K230-135
500	1K146-065
502	1K146-068
503	1K220-056
504	1K120-082
505	1K600-145

RR

部品対照表　Parts Number Reference Table

補助番号 Auxiliary Number	部品番号 Part Number
506	1K275-006
507	1K275-007
509	1K600-248
652	1K370-662
653	1K083-042
656	1K240-330
661	1K146-023
662	1K050-173
663	1K050-165
664	1K233-038
667	1K630-229
668	1K201-048
669	1K275-033
670	1K246-025
673	1K470-039
675	1K233-039
676	1K050-166
801	1K110-154
802	1K110-155
803	1K110-156
804	1K110-157
805	1K110-165
806	1K110-166
807	1K110-158
808	1K110-159
809	1K110-160
810	1K110-161
811	1K110-162
812	1K110-167
813	1K110-168
821	A1-17030BS
822	A1-17025SX
823	A1-17035BB
824	A1-20025SX
825	A1-20030SX
826	A1-20045FA
827	1K001-027

補助番号 Auxiliary Number	部品番号 Part Number
828	1K001-032
829	A2-20022SX
830	A2-20035SX
831	A1-17020BB
832	B1-20030BB
833	A1-17050BS
834	B1-20040SX
835	A1-20040BB
836	1K123-004
837	G1-17040SX
839	B1-17025BB
841	K2-20030BB
842	A1-20090FB
844	A2-14025FB
845	B1-20050SX
846	A2-17030SX
847	P3-16060SX
848	1K044-013
855	1K044-012
862	1K050-167
B11	1B001-085
B30	1B001-446
B43	1B060-178
B44	1B001-445
B45	1B060-179
B51	1B670-038
B52	1B314-105
B55	1B314-113
B71	1B100-250
B81	1B001-444
B91	1B670-036
B98	1B060-206
B99	1B150-031
B100	1B990-014
B112	1B990-015
B112	1B990-016
B116	1B990-013

補助番号 Auxiliary Number	部品番号 Part Number
B201	1B990-012
B201	1B990-017
B206	1B610-018
B213	1B001-450
B301	1B001-448
B323	1B060-181
B406	1B001-438
B425	1B260-019
B426	1B060-177
B429	1B001-440
B441	1B206-020
B447	1B475-040
B471	1B475-039
B491	1B314-102
B492	1B240-029
B493	1B260-007-1
B652	1B001-451
B653	1B990-008
B654	1B200-004
B659	1B001-439
B667	1B001-452-1
B2001	1B990-010
B2425	1B001-441
B2441	1B990-011
B2451	1B001-443
B3001	1B060-182

部品対照表　Parts Number Reference Table

補助番号 Auxiliary Number	部品番号 Part Number	補助番号 Auxiliary Number	部品番号 Part Number	補助番号 Auxiliary Number	部品番号 Part Number
1081	1S810-440				
1082	1S810-441				
1083	1S810-442				
1084	1S810-443				
1085	1S810-444				
1086	1S810-445				
1087	1S810-446				
1088	1S810-447				
1089	1S810-448				
1090	1S810-449				
1091	1S810-450				
1092	1S810-451				
1093	1S810-452				
1094	1S810-453				
1095	1S810-454				
1096	1S810-455				
1097	1S810-456				
1098	1S810-457				
1099	1S810-458				
1100	1S810-459				
1101	1S810-483				

RR

部 品 表 Parts list

FEA04051－R. 3145. A

部品番号 Part No.	補助番号 Ckt. No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Assembly	参照図番 Figure	販売区分 Term of Delivery	備考 Remarks
1K001-027	827	Screw	3		1	○	9F4B ♯827
1K001-032	828	Screw	2	1B990-016 1B990-015	10	○△	
1K044-012	855	スプリングピン Spring cotter	1	1B990-016 1B990-015	8	○△	9F4B ♯855
1K044-013	848	スプリングピン Spring cotter	2	1B990-016 1B990-015	11	○△	
1K050-029	29	Washer (t = 0.05)	0-1		6	○	9F4B ♯37B
1K050-031	29	Washer (t = 0.07)	0-1		6	○	9F4B ♯37C
1K050-035	29	Washer (t = 0.11)	0-1		6	○	9F4B ♯37D
1K050-048	29	Washer (t = 0.03)	0-1		6	○	9F4B ♯37A
1K050-165-1 1K050-165 Dis	663	巻戻Oリング板 Washer, rewind shaft O-ring	1	1B990-016 1B990-015 1B001-452	2	○△	9F4B ♯663
1K050-166 Dis 1K050-166-1	676	巻戻クラッチ座金 Washer, rewind clutch	1	1B990-016 1B990-015 1B001-452	2	○△	9F4B ♯676
1K050-167	862	スプロケットバネ座金 Washer, sprocket spring	1		4	○	
* 1K050-173	662	巻戻軸座金 Washer, rewind shaft	1	1B990-016 1B990-015 1B001-452	2	○△	
* 1K080-005	25	三角環保護カバー Triangular ring protector	2		11	○	9F4B ♯25
1K081-003	15	銘板 Name plate	1	1B990-016 1B990-015	11	○△	

部 品 表 Parts list

FEA04051－R. 3145. A

部品番号 Part No.	補助番号 Ckt. No.	名称 Name	1台分個数 Pcs.per Unit	部組品番号 Assembly	参照図番 Figure	販売区分 Term of Delivery	備考 Remarks
* 1K083-042	653	巻戻ノブ Rewind knob	1	1B001-452 1B990-009 1B990-015 1B990-016	2	○△	
1K087-124	14	T指標板 Index, shutter dial	1		11	○	
* 1K100-035	24	三角環 Triangular ring	2		11	○	9F4B # 24
* 1K110-090	73	圧接ゴム FPC spacer	1		3	○	
1K110-152	60	右前張革（オレンジ） Leatherette (orange)	1	1B990-015	11	○△	
1K110-153	61	左前張革（オレンジ） Leatherette (orange)	1	1B990-015	11	○△	
1K110-154	801	G1 Oリング O-ring, G1	1	1B990-016 1B990-015	8	○△	9F4B # 801
1K110-155	802	G3 Oリング O-ring, G3	1	1B990-016 1B990-015	8	○△	9F4B # 802
1K110-156	803	巻上軸Oリング O-ring, film-advance shaft	2	1B990-016 1B990-015	10, 11	○△	9F4B # 803
1K110-157	804	枚数計窓Oリング O-ring, frame counter window	1	1B990-016 1B990-015	11	○△	9F4B # 804
1K110-158	807	電池キャップOリング O-ring, battery chamber	1	1B001-445	1	○△	9F4B # 807
1K110-159	808	巻戻軸Oリング O-ring, rewind shaft	1	1B990-016 1B990-015 1B001-452	2	○△	9F4B # 808
1K110-160	809	マウントOリング O-ring, lens mount	1	1B990-016 1B990-015	11	○△	9F4B # 809
1K110-161	810	シンクロソケットOリング O-ring, sync socket	2	1B001-446 1B990-016 1B990-015	1	○△	9F4B # 810

RR

部 品 表 Parts list

FEA04051－R.3145.A

部品番号 Part No.	補助番号 Ckt. No.	名称 Name	1台分個数 Pcs.per Unit	部組品番号 Assembly	参照図番 Figure	販売区分 Term of Delivery	備考 Remarks
1K110-162	811	シンクロコネクタOリング O-ring, sync terminal	1	1B990-016 1B990-015	8	○△	9F4B＃811
1K110-163	210	裏蓋指当ゴム Rubber pad	1	1B990-012 1B990-015 1B990-016 1B990-017	9	○△	
1K110-164	219	裏蓋擬革（オレンジ） Leatherette(orange)	1	1B990-015 1B990-012	9	○△	
1K110-165	805	Tダイアルリング O-ring, shutter dial	1	1B990-016 1B990-015	2	○△	
1K110-166	806	巻上軸Oリング O-ring, film-advance shaft	1	1B990-016 1B990-015 1B990-011	2	○△	
1K110-167	812	裏蓋Oリング O-ring, camera back	1	1B990-016 1B990-015	9	○△	
1K110-168	813	巻上軸Oリング O-ring, film-advance shaft	1	1B990-016 1B990-015 1B990-011	2	○△	
1K110-178	60	右前擬革（グリーン） Leatherette (green)	1	1B990-016		○△	
1K110-179	61	左前擬革（グリーン） Leatherette (green)	1	1B990-016		○△	
1K110-180	219	裏蓋擬革（グリーン） Leatherette (green)	1	1B990-016 1B990-017		○△	
1K115-233	74	コード押えテープ Tape	7	1B990-013 1B990-015 1B990-016	6, 7, 8	○△	
1K115-793	63	枚数計窓遮光モルト Light-shield sponge	1	1B990-016 1B990-015	8	○△	
1K115-794-1	64	外箱遮光モルト Light-shield sponge	1		4	○	
1K115-796	68	電池室遮光モルト Light-shield sponge	1		4	○	9F4B＃68
1K115-792		Light-shield sponge					NO.8431 ¥10-

部 品 表 Parts list

FEA04051－R. 3145. A

部品番号 Part No.	補助番号 Ckt. No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Assembly	参照図番 Figure	販売区分 Term of Delivery	備考 Remarks
1K115-797	69	グリップ擬革 Leatherette, grip	1	1B990-016 1B990-015	11	○△	
1K115-799	321	復元レバーゴム Cushion, mirror down lever	1	1B990-013 1B001-448	7	○△	9F4B ♯321
1K115-800	327	遮光シート Light-shield seal	1		7	○	9F4B ♯327
1K115-801	328	カン衝ゴム Shock absorber	2	1B990-013	7	○△	9F4B ♯328
1K115-807	222	ヒンジガタ取ゴム Spacer	1	1B990-016 1B990-015	9	○△	
• 1K120-077	423	巻上カム止めネジ Set screw, film advance cam	1		4	○	9F4B ♯423
• 1K120-078	478	枚数計軸ネジ Screw, frame counter shaft	1	1B001-443	5	○△	9F4B ♯478
• 1K120-082	504	止めネジ Set screw	1		3	○	
1K120-175	53	押釦レバーネジ Screw, shutter release button	2	1B990-016 1B990-015	10, 11	○△	9F4B ♯53
1K120-176	316	シャッタースタートレバー軸 Axle, shutter release lever	1	1B990-013	7	○△	9F4B ♯316
• 1K123-004	836	バヨネット止めネジ Screw, bayonet mount	7	1B990-016 x3 1B990-015 x3	6, 9	○△	9F4B ♯836
• 1K123-044	413	スプロケットネジ Sprocket screw	1		4	○	
• 1K130-088-2 (1K130-088)	408	チャージ伝達レバー軸 Shaft, charge transmission lever	1		4	○	9F4B ♯408
• 1K130-089	409	チャージレバー軸 Charge lever shaft	1		4	○	9F4B ♯409
1K120-187		Screw					¥10- No9425
1K120-188		Screw					¥10- No9423

RR

部 品 表 Parts list

FEA04051-R.3145.A

部品番号 Part No.	補助番号 Ckt. No.	名称 Name	1台分個数 Pcs per Unit	部組品番号 Assembly	参照図番 Figure	販売区分 Term of Delivery	備考 Remarks
1K130-090	412	シャッターチャージレバー軸 Shaft, shutter charge lever	1		4	○	9F4B # 412
1K130-200	433	レリーズレバーネジ Release lever screw	2		6	○	9F4B # 433
1K130-202	209	枚数計リセットピン Pin, frame counter reset	1	1B990-012 1B990-015 1B990-016 1B990-017	9	○△	
1K130-203	438	巻上レバーネジ Screw, film-advance lever	1	1B990-016 1B990-015 1B990-011	2	○△	
1K130-206	311	復元バネネジ Screw, mirror down spring	1	1B990-013	7	○△	
*1K146-022-1 (1K146-022)	427	レリーズレバーバネ掛け Spring stud, release lever	1		6	○	9F4B # 427
*1K146-023	661	巻戻ノブ取付ネジ Set screw, rewind knob	1	1B001-452 1B990-009 1B990-015 1B990-016	2	○△	
1K146-065	500	グレイコード支柱 Axle, printed circuid board	2		5	○	
1K146-068	502	プリント板支柱 Axle, printed circuit board	3		3	○	
1K160-405	21	内側バヨネット Bayonet mount (inner)	1		6	○	9F4B # 21
1K160-406	421	巻上軸止め座金 Washer, film-advance shaft	1		4	○	9F4B # 421
1K160-416	208	枚数計りセットピン調整座 Spacer, frame counter reset	0-1	1B990-012 1B990-015 1B990-016 1B990-017	9	○△	
1K165-065	59	裏蓋カギ座金 Washer, lock knob	3	1B990-016 1B990-015	10, 11	○△	
DIS 1K165-066	223	蝶番軸座金 Washer, hinge shaft	2	1B990-012 1B990-015 1B990-016 1B990-017	9	○△	NO. 8508 9F4B # 223

部 品 表 Parts list

FEA04051－R. 3145. A

部品番号 Part No.	補助番号 Ckt. No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Assembly	参照図番 Figure	販売区分 Term of Delivery	備考 Remarks
1K201-048	668	ASA/ ISO 目盛環 ASA/ ISO dial	1		2	○	
1K206-028	56	押釦ロック Lock knob, shutter release button	1	1B670-038	11	○△	
1K206-029	58	押釦指当 Shutter release button	1	1B990-016 1B990-015	11	○△	
1K206-030	83	圧板蝶番軸受 Bearing, pressure plate hinge	2		1	○	
1K208-043	211	裏蓋ノブ解除釦 Release button, lock knob	1	1B990-016 1B990-015	10	○△	
1K208-044	443	巻上レバーゴム Rubber, film-advance lever	1		2	○	
* 1K220-056	503	スプールフリクションバネ Spool friction spring	1	1B001-441	4	○△	9F4B # 503
1K220-143	419	スプロケットバネ Sprocket spring	1		4	○	
1K225-086	428	レリーズレバーバネ Release lever spring	1		6	○	9F4B # 428
1K230-128	92	圧板蝶番バネ Spring, pressure plate hinge	1		1	○	9F4B # 92
1K230-129	305	鏡動レバーバネ Spring, mirror actuating lever	1	1B990-013 1B001-448	7	○△	9F4B # 305
1K230-130	314	掛け外しレバーバネ Spring, quick return lever	1	1B990-013 1B001-448	7	○△	9F4B # 314
1K230-131	320	レリーズカギレバーバネ Spring, shutter release hook	1	1B990-013 1B001-448	7	○△	9F4B # 320
1K230-133	310	復元バネ Spring, mirror down lever	1	1B990-013	7	○△	

部 品 表 Parts list

FEA04051－R. 3145. A

部品番号 Part No.	補助番号 Ckt. No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Assembly	参照図番 Figure	販売区分 Term of Delivery	備考 Remarks
1K230-135	498	レリーズロックバネ Spring, shutter release lock	1		3	○	
1K230-136	475	枚数計バネ Frame counter spring	1	1B001-443	5	○△	9F4B＃475
1K233-038	664	巻止Oリング板止め Stopper , rewind shaft O-ring	1	1B990-016 1B990-015 1B001-452	2	○△	9F4B＃664
1K233-039	675	ASA/ ISO 目盛軸止め Stopper, ASA/ISO dial shaft	1		2	○	
1K240-317	217	ロックバネ Spring, camera back lock knob	1	1B990-016 1B990-015	10	○△	
1K240-318	221	パトローネ押えバネ Film cartridge retainer	1	1B990-012 1B990-015 1B990-016 1B990-017	9	○△	
1K240-330	656	巻戻レバー受バネ Spring, rewind knob	1	1B001-452 1B990-009 1B990-015 1B990-016	2	○△	
1K246-025	670	ASA/ ISO目盛バネ Spring, ASA/ISO dial	1		2	○	9F4B＃670
1K260-143-X	466	スプロケットギア Sprocket gear	1		4	○	
1K260-144	495	T切換クリック板 Click plate, shutter dial	1		3	○	
1K260-147	477	枚数計ギア Frame counter gear	1	1B001-443	5	○△	9F4B＃477
* 1K275-006	506	スプール Spool	1		4	○	9F4B＃506
* 1K275-007	507	スプロケット Sprocket	1		4	○	
1K275-033	669	ASA/ ISOクリック板 Click plate, ASA/ISO dial	1	1B990-016 1B990-015	11	○△	9F4B＃669

部 品 表 Parts list

FEA04051－R. 3145. A

部品番号 Part No.	補助番号 Ckt. No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Assembly	参照図番 Figure	販売区分 Term of Delivery	備考 Remarks
1K300-052	401	巻上カム Take-up cam	1		4	○	9F4B ♯401
1K310-053	216	裏蓋ロックカム Lock cam, camera back	1	1B990-016 1B990-015	10	○△	
1K314-197	315	シャッタースタートレバー Shutter release lever	1	1B990-013	7	○△	9F4B ♯315
1K314-204	407	駆動部チャージレバー Mirror charge lever	1		4	○	9F4B ♯407
1K340-080	416	スプロケットカラー Sprocket collar	1		4	○	9F4B ♯416
1K340-082	405	スプール軸受 Spool bearing	1		4	○	
1K360-020	84	圧板蝶番軸 Pressure plate hinge	1		1	○	9F4B ♯84
1K362-021	203	裏蓋軸 Camera back shaft	1	1B990-012 1B990-015 1B990-016 1B990-017	9	○△	
1K370-661	424	スプロケット軸 Sprocket shaft	1		4	○	9F4B ♯424
1K370-662 Diss	652	巻戻軸 Rewind shaft	1	1B001-451 1B001-452 1B990-015 1B990-016	2	○△	
1K400-078	35	三脚ネジ Tripod screw	1	1B990-016 1B990-015	8	○△	
1K467-058	30	シンクロキャップ Sync terminal cap	1	1B001-446	1	○△	
1K470-039	673	ASA/ISO目盛板 ASA/ISO scale ring	1	1B990-016 1B990-015 1B001-452	2	○△	
* 1K480-016	472	枚数計指標 Index plate, frame counter	1	1B001-443	5	○△	

部 品 表 Parts list

FEA04051−R. 3145. A

部品番号 Part No.	補助番号 Ckt. No.	名称 Name	1台分個数 Pcs per Unit	部組品番号 Assembly	参照図番 Figure	販売区分 Term of Delivery	備考 Remarks
1K480-018	212	裏蓋ロック軸カバー Lock knob cover, camera back	1	1B990-016 1B990-015	10	○△	
1K600-145	505	スプールフリクションバネ受 Acceptor, spool friction spring	1	1B001-441	4	○△	9F4B ♯505
* 1K600-148-1 (1K600-148)	77	圧接板 FPC retainer	1		3	○	
* 1K600-248	509	フリクション板 Friction plate	2	1B001-441	4	○△	9F4B ♯504A
1K600-306	19	フレーム調整座 (t = 0.2) Viewfinder spacer	0-1	1B990-016 1B990-015	8	○△	9F4B ♯19A
1K600-307	19	フレーム調整座 (t = 0.15) Viewfinder spacer	0-1	1B990-016 1B990-015	8	○△	9F4B ♯19B
1K600-308	19	フレーム調整座 (t = 0.1) Viewfinder spacer	0-1	1B990-016 1B990-015	8	○△	9F4B ♯19C
1K600-309	19	フレーム調整座 (t = 0.05) Viewfinder spacer	0-1	1B990-016 1B990-015	8	○△	9F4B ♯19D
1K600-311	101	シュー補助板 Shoe mount spacer	1	1B990-016 1B990-015	11	○△	9F4B ♯101
1K600-313	418	巻上カム調整板 Adjuster, film-advance cam	1		4	○	9F4B ♯418
1K600-327	205	裏蓋Oリング押え板 Retainer, camera back	1	1B990-012 1B990-015 1B990-016 1B990-017	9	○△	
1K600-328	225	裏蓋ロックピン調整座(t=0.1) Spacer, camera back lock	0-1	1B990-012 1B990-015 1B990-016 1B990-017	9	○△	
1K600-329	225	裏蓋ロックピン調整座(t=0.2) Spacer, camera back lock	0-1	1B990-012 1B990-015 1B990-016 1B990-017	9	○△	
* 1K607-002	34	消音ゴム Shock absorber	1		4	○	

部 品 表 Parts list

FEA04051－R. 3145. A

部品番号 Part No.	補助番号 Ckt. No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Assembly	参照図番 Figure	販売区分 Term of Delivery	備考 Remarks
* 1K610-257-1 (1K610-257)	72	圧接板 FPC retainer	1		3	○	
1K610-519	13	シュー Accessory shoe	1	1B990-016 1B990-015	11	○△	9F4B # 13
1K610-523	437	レリーズレバー受け Acceptor, shutter release lever	1		4	○	9F4B # 437
1K610-527	202	裏蓋ヒンジ板 Camera back hinge	1	1B990-016 1B990-015	9	○△	
* 1K630-105	422	スプール内筒 Spool internal tube	1		4	○	9F4B # 422
1K630-229 D15 1K630-229-1	667	ASA/ISO 目盛軸 ASA/ISO dial shaft	1	1B990-016 1B990-015 1B001-452	2	○△	9F4B # 667
1K640-426	38	外箱マウント Lens mount, outer housing	1	1B990-016 1B990-015	11	○△	9F4B # 38
1K640-442	23	遮光板 Light-tight washer	1		4	○	23F8 # 23 9F4B # 23
1K646-004-1	16	接眼窓 Eyepiece window	1	1B990-016 1B990-015	8	○△	
1K646-005	17	G 2 受け Retainer, G 2	1	1B990-016 1B990-015	8	○△	
1K646-006	18	G 3 受け Retainer, G 3	1	1B990-016 1B990-015	8	○△	
1K646-007	20	G 4 受け Retainer, G 4	1	1B990-016 1B990-015		○△	
1K680-382	57	押釦ロック板 Lock knob plate, relese button	1	1B680-382	11	○△	
1K680-383	93	圧板押え Retainer, pressure plate	1		1	○	

部 品 表 Parts list

FEA04051-R. 3145. A

部品番号 Part No.	補助番号 Ckt. No.	名称 Name	1台分個数 Pcs. per Unit	部組品番号 Assembly	参照図番 Figure	販売区分 Term of Delivery	備考 Remarks
1K680-393	220	裏蓋ヒンジカバー Cover, camera back hinge	1	1B990-016 1B990-015	9	○△	
1K680-401	28	ファインダー前枠 Front cover, finder	1	1B990-016 1B990-015	8	○△	
1G226-002	G1	Lens	1	1B990-016 1B990-015	8	○△	9F4B # G1
1G234-001	G2	Lens	1	1B990-016 1B990-015	8	○△	
1G133-002	G3	Lens	1	1B990-016 1B990-015	8	○△	
1G133-003	G4	Lens	1	1B990-016 1B990-015	8	○△	
1G580-002	G5	Mirror	1	1B990-016 1B990-015	8	○△	
1G122-002	G9	駒数計窓 Frame counter window	1	1B990-016 1B990-015	11	○△	
1S810-440	1081	リード線 Lead wire	1	1B060-181		△	W-0056BK
1S810-441	1082	リード線 Lead wire	1	1B060-181		△	W-0056BE
1S810-442	1083	リード線 Lead wire	1	1B990-014		△	W-0056PU
1S810-443	1084	リード線 Lead wire	1	1B060-182		△	W-0056YE
1S810-444	1085	リード線 Lead wire	1	1B990-014		△	W-0056GN
1S810-445	1086	リード線 Lead wire	1	1B990-014		△	W-0056BN
1S310-067		Resister (1kΩ)					N-850003 ¥28-8205

部 品 表 Parts list

FEA04051－R. 3145. A

部品番号 Part No.	補助番号 Ckt. No.	名称 Name	1台分個数 Pcs.per Unit	部組品番号 Assembly	参照図番 Figure	販売区分 Term of Delivery	備考 Remarks
1S810-446	1087	リード線 Lead wire	1	1B060-182		△	W-0056PU
1S810-447	1088	リード線 Lead wire	1	1B990-014		△	W-0056BE
1S810-448	1089	リード線 Lead wire	1	1B060-182		△	W-0056GN
1S810-449	1090	リード線 Lead wire	1	1B990-014		△	W-0056WH
1S810-450	1091	リード線 Lead wire	1	1B060-178		△	W-0056RE
1S810-451	1092	リード線 Lead wire	1	1B150-031		△	W-0056OR
1S810-452	1093	リード線 Lead wire	1	1B150-031		△	W-0056PU
1S810-453	1094	リード線 Lead wire	1	1B060-206		△	W-0056BN
1S810-454	1095	リード線 Lead wire	1	1B060-206		△	W-0056GN
1S810-455	1096	リード線 Lead wire	1	1B060-179		△	W-0056BK
1S810-456	1097	リード線 Lead wire	1	1B060-182		△	W-0056BK
1S810-457	1098	リード線 Lead wire	1	1B990-014		△	W-0056GY
1S810-458	1099	リード線 Lead wire	1	1B060-182		△	W-0056BE
1S810-459	1100	リード線 Lead wire	1	1B990-014		△	W-0056YE

部 品 表 Parts list

FEA04051－R.3145. A

部品番号 Part No.	補助番号 Ckt. No.	名称 Name	1台分個数 Pcs per Unit	部組品番号 Assembly	参照図番 Figure	販売区分 Term of Delivery	備考 Remarks
1S810-483	1101	リード線 Lead wire	1	1B060-182		△	W-0056BK
(D15) A1-17020BB	831	Screw	3		3	○	
A1-17025SX	822	Screw	11 ↓ 9	1B990-016 x 7 1B990-015 x 7	5, 8, 10	○△	
A1-17030BS	821	Screw	5		1, 5	○	9F4B # 821
(D15) A1-17035BB	823	Screw	3	1B990-013 1B001-443 x 1	5, 6, 7	○△	
A1-17050BS	833	Screw	2		1	○	9F4B # 833
A1-20025SX	824	Screw	4	1B990-012 1B990-013 x2 1B990-015 1B990-016 1B990-017	7, 9	○△	9F4B # 824
A1-20030SX	825	Screw	3		6	○	9F4B # 825
A1-20040SX	835	Screw	1		6	○	Y10- NO 8429
A1-20045FA	826	Screw	2		6	○	
A1-20090FB	842	Screw	1		3	○	
A2-14025FB	844	Screw	2		3	○	
A2-17030SX	846	Screw	9	1B990-012 1B990-015 1B990-016 1B990-017	9	○△	
A2-20022SX	829	Screw	4	1B990-016 x3 1B990-015 x3	4, 11	○△	9F4B # 829

部 品 表 Parts list

FEA04051－R. 3145. A

部品番号 Part No.	補助番号 Ckt. No.	名称 Name	1台分個数 Pcs per Unit	部組品番号 Assembly	参照図番 Figure	販売区分 Term of Delivery	備考 Remarks
A2-20035SX	830	Screw	4	1B990-016 1B990-015	11	○△	
(DIS) B1-17025BB	839	Screw	1 ↓ 3		3, 1	○	
B1-20030BB	832	Screw	5	1B990-013 x 3	6, 7	○	9F4B # 832
B1-20040SX	834	Screw	1	1B990-016 1B990-015	11	○△	
B1-20050SX	845	Screw	1	1B990-012 1B990-015 1B990-016 1B990-017	9	○△	
G1-17040SX	837	Screw	4 ↓ 3	1B990-013 1B150-031 1B670-038 1B060-206	11	○△	
K2-20030BB	841	Screw	1	1B990-016 1B990-015	8	○△	9F4B # 841
P3-16060SX	847	スプリングピン Spring cotter	1	1B001-451 1B001-452 1B990-015 1B990-016	2	○△	9F4B # 847
B1-17035BB							~ 8429

部組品一覧表 Assembly List

FEA04051－R. 3145. A

部組品番号 Assembly No.	補助番号 Ckt. No.	名称 Name	1台分個数 Pcs.per Unit	構成部品番品 Constituent Parts	参照図番 Figure	備考 Remarks
*1B001-085	B11	つり環 Eyelet	2	1K044-001 1K100-034	11	
1B001-438	B406	シャッターチャージレバー Shutter charge lever	1	1K314-199 , 1K314-206 1K340-037 , 1K370-321 1K370-322 , 1K370-323 1K640-436	4	
1B001-439	B659	巻戻フォーク軸 Rewind fork axle	1	1K370-675 1K630-231	6	
1B001-440	B429	半押スイッチ Release button switch	1	1K240-324 , 1K240-325 1K600-142 , 1K680-149 1K680-150 ,	6	
1B001-441	B2425	スプール軸 Spool shaft	1	1K220-056 , 1K600-145 1K600-248 x2 1B260-019	4	9F4B FA2-425
1B001-443	B2451	巻上基板部 Film-advance unit	1	1K060-030 , 1K120-078 1K220-139 x3 1K230-132 , 1K230-134 1K230-136 , 1K233-036 1K240-320 , 1K260-038 1K260-132 , 1K260-147 1K275-034 , 1K310-050 1K314-189 , 1K314-200 1K314-203 , 1K340-072 1K340-083 , 1K340-086 1K340-088 , 1K340-089 1K362-012 x3 1K370-326 , 1K370-673 1K370-674 , 1K370-678 1K370-679 , 1K370-680 1K370-681 , 1K370-682 1K480-016 , 1K600-146 1K610-529 , 1K610-530 1K640-437 , 1B240-028 1B240-029 , 1B475-039 A1-17035BB S1-01200SX x2	5	
1B001-444	B81	圧板 Pressure plate	1	1K083-040 , 1K240-309 1K340-077 x2 1K600-310	1	
1B001-445	B44	電池キャップ Battery cap	1	~~1K110-158~~ , 1K467-059 1K630-082 NO. 8909	1	
(DELETION) 1B001-446		Snc terminal cap		To be order as (K110-161 and 1K467-058		

部組品一覧表 Assembly List

FEA04051－R. 3145. A

部組品番号 Assembly No.	補助番号 Ckt. No.	名称 Name	1台分個数 Pcs.per Unit	構成部品番品 Constituent Parts	参照図番 Figure	備考 Remarks
1B001-448	B301	駆動基板部 Mirror actuating unit	1	1K115-799 ,1K230-129 1K230-130 ,1K230-131 1K314-194 ,1K314-195 1K314-196 ,1K314-198 1K340-078 ,1K340-079 1K366-045 ,1K366-046 1K370-658 ,1K370-659 1K370-660 ,1K610-522 1S720-036 ,	7	
1B001-450	B213	裏蓋ロック軸 Lock knob, camera back	1	1K044-014 x2 1K206-031 ,1K240-319 1K370-670 ,1K370-671	10	
1B001-451 (1B001-451-1)	B652	巻戻軸 Rewind shaft	1	1K370-662 P3-16060SX	2	
1B001-452-1 1B001-452-4	B667	巻戻ノブ Rewind knob	1	1K050-165 ,1K050-166 1K050-173 ,1K083-042 1K110-159 ,1K146-023 1K233-038 ,1K240-330 1K470-039 ,1K630-229 1B001-451 ,1K200-004	2	
1B001-446	B30	シンクロキャップ Sync terminal cap	1	1K110-161 1K467-058 *one can order single part	1	
1B060-177	B426	レリーズレバー Shutter release lever	1	1K314-202 ,1K366-047 1K366-048 ,1S720-037	6	
1B060-178	B43	電池ケース Battery chamber	1	1K048-068 ,1K240-050-2 1K610-174 ,1K680-381 1S810-450	6	
1B060-179	B45	電池アース接片 Battery earth contact	1	1K156-040 1S810-455	6	
1B060-181	B323	記憶スイッチ Memory switch	1	1K240-311 ,1K240-312 1K600-312 x2 1K680-386 ,1S810-440 1S810-441	7	
1B060-182	B3001	シンクロガイド環 Sync terminal	1	1K044-011 x5 1K220-142 x2 1K370-653 x3 1K370-654 x2 1K370-655 x2 1S110-007 ,1S810-443 1S810-446 ,1S810-448 1S810-456 ,1S810-458 1S810-483	8	

部組品一覧表 Assembly List

FEA04051－R.3145.A

部組品番号 Assembly No.	補助番号 Ckt. No.	名称 Name	1台分個数 Pcs.per Unit	構成部品番品 Constituent Parts	参照図番 Figure	備考 Remarks
1B060-206	B98	TTL 調光用受光素子 SPD 2	1	1K680-384 ,1S250-004 1S700-071 ,1S810-453 1S810-454 G1-17040SX	7	
1B100-250	B71	LED 基板 LED base plate	1	1K008-001 x2 1K115-795 ,1K240-308 1K340-077 ,1K610-520 1G550-019	8	
1B150-031	B99	測光用受光素子 SPD 1	1	1K680-385 ,1S250-004 1S700-071 ,1S810-451 1S810-452 ,1G120-001 G1-17040SX	7	
*1B200-004-1	B654	巻戻レバー Rewind lever	1	1K370-340 ,1K610-250 1K630-233	2	
1B206-020	B441	巻上レバー Film-advance lever	1	1K048-069 x3 1K340-085 ,1K625-032	2	
1B240-029	B492	空撮スイッチ Blank shot switch	1	1K240-327 ,1K240-328 1K600-143 x2 1K680-148	5	
*1B260-007-1 (1B260-007)	B493	グレーコード板 Gray code disk	1	1K240-105 1K260-047-1	3	
1B260-019	B425	スプール軸 Spool shaft	1	1K260-146 1K370-677	4	9F4B FA1- 425
1B314-102	B491	グレーコード基板 Gray code base plate	1	1K156-045 ,1K240-321 1K625-033	3	
1B314-105	B52	押釦レバー軸 Axle, shutter release button	1	1K314-192 1K370-657	11	
1B314-113	B55	押釦外レバー Release button lever	1	1K314-193 1K370-656	11	
1B475-039	B471	枚数計ラチエット Frame counter ratchet	1	1K275-035 1K470-042	5	
1B475-040	B447	T切換ダイアル Shutter dial	1	1K201-047 ,1K340-084 1K470-040	2	
1B610-018	B206	裏蓋ロックピン Lock pin, camera back	1	1K370-669 1K610-528	9	

部組品一覧表 Assembly List

FEA04051－R. 3145. A

部組品番号 Assembly No.	補助番号 Ckt. No.	名称 Name	1台分個数 Pcs.per Unit	構成部品番品 Constituent Parts	参照図番 Figure	備考 Remarks
1B670-036	B91	本体カバー Body cover	1	1K115-812 1K670-040	1	
1B670-038	B51	押釦カバー Shutter release button cover	1	1K206-028 ,1K670-039 1K680-382 ,G1-17040SX	11	
1B990-008	B653	巻戻ノブ Rewind knob	1	1K083-042 ,1K146-023 1K240-330 ,1B200-004	2	
1B990-010	B2001	FPC	1	1K050-169 ,1K240-110-2 1K240-310 ,1K240-323 1K610-521 ,1K640-438 1S120-013 ,1S210-007 1S237-038 ,1S237-042 1S310-057 ,1S310-058 1S310-059 ,1S310-060 1S310-061 ,1S310-062 1S310-064 ,1S310-065 1S310-066 ,1S310-067 1S310-068 ,1S310-069 1S310-070 ,1S322-031 1S322-034 ,1S322-037 1S335-006 x3 1S335-008 x2 1S335-011 ,1S340-051 1S335-042 x2 1S340-052 x3 1S340-053 ,1S382-004 1S705-038 ,1S708-006 1S730-002 x2 1S700-072	3	
1B990-011 ↓ (DIS) 1B999-161	B2441	巻上レバー Film-advance lever	1	1K110-166 ,1K110-168 1K130-203 ,1K136-030 1K206-032 ,1K607-017 1K240-322 x2 G1-20030SX x2 1B206-020 ,1B475-040	2 ¥590-	NO 8815
1B990-012	B201	裏蓋（オレンジ） Camera back (orange)	1	1K110-163 ,1K110-164 1K130-202 ,1K160-416 1K165-066 x2 1K240-318 ,1K362-021 1K600-327 ,1K600-328 1K600-329 ,1K670-042 A1-20025SX x2 A2-17030SX x9 B1-20050SX ,1B610-018	9	
1B999-021		Drive Housing 中箱組品		1988.1.1	16.380- ↓ 12.460-	8435

部組品一覧表 Assembly List

FEA04051－R. 3145. A

部組品番号 Assembly No.	補助番号 Ckt. No.	名称 Name	1台分個数 Pcs.per Unit	構成部品番品 Constituent Parts	参照図番 Figure	備考 Remarks
1B990-013(DIS) 1B998-050	B116	前板 Front plate	1	1K115-801 x2 1K120-176 .1K130-206 1K230-133 .1K314-197 1K670-043 .A1-17035BB 1K115-233 A1-20025SX x2 B1-20030BB x3 1B001-448 .1B060-181 1B060-206 .1B150-031	6, 7 ¥2100- NO8549	
1B990-014	B100	シャッター Shutter	1	1S810-442 .1S810-444 1S810-445 .1S810-447 1S810-449 .1S810-457 1S810-459	6	
(OLD) 1B990-015 1B990-015-1	B112	外箱（オレンジ） Outer housing (orange)	1	1K001-032 x2 1K044-012 .1K081-003 1K044-013 x2 1K110-152 .1K110-153 1K110-154 .1K110-155 1K110-156 x2 1K110-157 .1K110-160 1K110-161 .1K110-162 1K110-165 .1K110-167 1K115-792 .1K115-793 1K115-797 .1K115-807 1K120-175 x2 1K123-004 x3 1K165-065 x3 1K206-029 .1K208-043 1K240-317 1K275-033 1K310-053 .1K400-078 1K480-018 .1K600-306 1K600-307 .1K600-308 1K600-309 .1K600-311 1K600-328 .1K600-329 1K610-519 .1K610-527 1K640-426 .1K646-004 1K646-005 .1K646-006 1K646-007 .1K660-038 1K680-393 .1K680-401 1K115-233 1G122-002 .1S133-002 1G133-003 .1G226-002 1G234-001 .1G580-002 A1-17025SX x7 A2-20022SX x3 A2-20035SX x4 B1-20040SX .K2-20030BB 1B001-085 x2 1B001-450 .1B100-250 1B314-105 .1B314-113 1B670-038 .1B990-011 1B990-012	2, 8 9, 10 11	¥ 17640-

部組品一覧表 Assembly List

FEA04051－R. 3145. A

部組品番号 Assembly No.	補助番号 Ckt. No.	名称 Name	1台分個数 Pcs.per Unit	構成部品番品 Constituent Parts	参照図番 Figure	備考 Remarks
(OLD) 1B990-016 1B990-016-1	B112	外箱（グリーン） Outer housing (green)	1	1K001-032 x2 1K044-012 ,1K081-003 1K044-013 x2 1K110-154 ,1K110-155 1K110-156 x2 1K110-157 ,1K110-160 1K110-161 ,1K110-162 1K110-165 ,1K110-167 1K110-178 ,1K110-179 1K115-792 ,1K115-793 1K115-797 ,1K115-807 1K120-175 x2 1K123-004 x3 1K165-065 x3 1K206-029 ,1K208-043 1K240-317 ,1K275-033 1K310-053 ,1K400-078 1K480-018 ,1K600-306 1K600-307 ,1K600-308 1K600-309 ,1K600-311 1K600-328 ,1K600-329 1K610-519 ,1K610-527 1K640-426 ,1K646-004 1K646-005 ,1K646-006 1K646-007 ,1K660-044 1K680-393 ,1K680-401 1K115-233 . 1G122-002 ,1G133-002 1G133-003 ,1G226-002 1G234-001 ,1G580-002 A1-17025SX x7 A2-20022SX x3 A2-20035SX x4 B1-20040SX ,K2-20030BB 1B001-085 x2 1B001-450 ,1B001-452 1B060-182 ,1B100-250 1B314-105 ,1B314-113 1B990-011 ,1B990-017 1B670-038	第17.6.0	
1B990-017	B201	裏蓋（グリーン） Camera back (green)	1	1K110-163 ,1K110-180 1K130-202 ,1K160-416 1K165-066 x2 1K240-318 ,1K362-040 1K600-327 ,1K600-328 1K600-329 ,1K670-046 A1-20025SX x2 A2-17030SX x9 B1-20050SX ,1B610-018		